Report of the Commission of Inquiry on the New Airport

CONTENTS

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Appendices

Abbreviations

A

'A' buses	Airbuses
AA	Airport Authority
AAT	Asia Airfreight Terminal Company Limited
ACC	Apron Control Centre
ACCS	Air Cargo Clearance System
ACP	Airport Core Programme
ACS	Access Control System
ADSCOM	Airport Development Steering Committee
AE	Airport Express
AEC	Airport Emergency Centre
AEH	AEH Joint Venture
AFC	Airport Fire Contingent
AFFC	Airport Freight Forwarding Centre
AIDB	Aeronautical Information Database
AMD	Airport Management Division, AA
AMFSRC	Airport Main Fire Station Rescue Control
Ansett	Ansett Australia O/B Ansett International Limited
AOCC	Airport Operations Control Centre
AOD	airport opening day
AODB	Airport Operational Database
AOR	airport operational readiness
APA	Aircraft Parking Aid
APM	Automated People Mover
APV	Apron Passenger Vehicle
AR	Airport Railway
ARA	Airport Restricted Area
ATA	actual time of arrival
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATD	actual time of departure
Atlas Air	Atlas Air, Inc.
ATV	automatic transfer vehicle
AVAS	Audio and Visual Advisory System

AVSECO	Aviation Security Company Limited

B

BAA	British Airport Authority
BCJ	British-Chinese-Japanese Joint Venture
BCR	Baggage Control Room
Bechtel	International Bechtel Company Ltd.
BGR	boarding gate reader
BHO	baggage handling operator
BHS	Baggage Handling System
BMS	Building Management System
BP	boarding pass
BRH	Baggage Reclaim Hall
BSI	Building Systems Integration
BSM	Baggage Source Message
BSS	Box Storage System
Bukaka Ramp	PT. Bukaka Teknik Utama-RAMP Joint Venture

C

C & ED	Customs and Excise Department
CAD	Civil Aviation Department
CAL	China Airlines Ltd.
Canadian Airlines	Canadian Airlines International Limited
Carrier	Carrier Hong Kong Limited
CAS	Common Antenna System
Cathay Pacific	Cathay Pacific Airways Limited
CCTV	closed circuit television
CDG	Control Systems Development Group
CEM	Controlled Electronic Management Systems Limited
CEO	Chief Executive Officer
Cevasa Imagen	Cevasa Imagen S.A.
the Chief Secretary	W36 Mrs Anson CHAN, the Chief Secretary for Administration and Chairman of ADSCOM
CHO	cargo handling operator
CHS	Cargo Handling System
City U	City University

CLK	Chek Lap Kok
CLP	China Light & Power Company Limited
CMT	China Motion United Telecom Limited
CNIM	Constructions Industrielles De La Mediterranee SA
Commission	Commission of Inquiry on the New Airport
COSAC	Community System for Air Cargo
CPCS	Cathay Pacific Catering Services
CPM	Consultant Project Manager
CPU	Central Processing Unit
Crisplant	Crisplant Limited
CSE	CSE International Ltd.
CSS	Container Storage System
CTO	cargo terminal operator
CUTE	Common User Terminal Equipment

D

DAC	Distributed Access Controller
DAN	Distributed Antenna Network
DCA	Director of Civil Aviation
DCS	Departure Control System
Demag	Mannesmann Dematic AG Systeme
DHL	DHL International (Hong Kong) Ltd.
Dragon Air	Hong Kong Dragon Airlines Limited

E

‘E’ buses	external buses
EDS	Electronic Data Systems Limited
EEV	EEV Limited
EMC	Equipment Motion Control
ENG	Engineering Department, HACTL
ESRA	Enhanced Security Restricted Area
ETA	estimated time of arrival
ETD	estimated time of departure
ETV	elevating transfer vehicle
ExCo	Executive Council

F

FAT	factory acceptance test
FDDFS	Flight Display Data Feed Services
FDDS	Flight Data Display System
Ferranti	Ferranti Air Systems Limited
FIDS	Flight Information Display System
FIMI	FIMI-Philips S.r.l.
FS	Financial Secretary
FSA	Support Agreement Relating to the Financing, Construction and Operation of the Airport
FSCC	Fire Services Communication Centre
FSD	Fire Services Department

G

GBMS	General Building Management System
GCPA	General Coverage Public Address
GEC	G.E.C. (Hong Kong) Ltd.
GPY	Gammon Paul Y Joint Venture
Grant	Grant Ameristone Limited
GSM	Global System for Mobile Telecommunications
GTC	Ground Transportation Centre
Guardforce	Guardforce Limited

H

HACTL	Hong Kong Air Cargo Terminals Limited
HAECO	Hong Kong Aircraft Engineering Company Limited
HAS	Hong Kong Airport Services Ltd.
HATS	Hong Kong Air Terminal Services Ltd.
Hepburn	Hepburn Systems Limited
HKASP	Hong Kong Aviation Security Programme
HKIA-ASP	Hong Kong International Airport-Airport Security Programme
HKSAR	Hong Kong Special Admnistrative Region
HKT	Hong Kong Telecom CSL Limited

hrs	hours
Hughes	Hughes Asia Pacific (Hong Kong) Limited
Hutchison	Hutchison Telecommunications (Hong Kong) Ltd.

I

IATA	International Air Transport Association
ICL	International Computers Limited
ID	Identification
IS	Interchange Server
ISD	Information Services Department, HACTL
IT	Information Technology

J

JAL	Japan Airlines Company Limited
JATS	Jardine Air Terminal Services Ltd.

K

KLM	KLM Royal Dutch Airlines

L

LCD	liquid crystal display
LCS	Logistic Control System
Level(s)	Level(s) of the passenger terminal building
Level(s)	Level(s) of the baggage security screening
level(s)	levels of the Cargo Handling System in SuperTerminal 1
Lo's	Lo's Airport Cleaning Services Limited

M

MAZ	manual all zone
MCC	motor control centre
MFT	Multi-Functional Terminals

MHI	Mitsubishi Heavy Industries, Ltd.
MHS	Material Handling System
min	minute(s)
MMI	Man Machine Interface
Mott	The Mott Consortium
MTR	Mass Transit Railway
MTRC	Mass Transit Railway Corporation
Murata	Murata Machinery (HK) Ltd.

N

NAPCO	New Airport Projects Co-ordination Office
Nishimatsu	Nishimatsu Construction Co., Ltd.
NWT	New World Telephone Limited

O

OCPM	Operations Computer Project Manager
OFTA	Office of Telecommunications Authority
Ogden	Ogden Aviation (Hong Kong) Limited
OOG	out-of-gauge
OP	occupation permit
OPS	Operations Department, HACTL
OPT	Operations Project Team
Oracle Systems	Oracle Systems Hong Kong Ltd.

P

PA	Public Address System
PAA	Provisional Airport Authority
PABX	Private Automatic Branch Exchange
para(s)	paragraph(s)
PCHC	Perishable Cargo Handling Centre
PD	Project Division, AA
Pearl	Pearl Delta WMI Limited
PIN	personal identification number
PLC	Programmable Logic Controller
Preston	The Preston Group Pty Ltd.

PRs	problem reports
PTB	Passenger Terminal Building
PTS	particular technical specifications

R

RAM	Random Access Memory
RASTI	Rapid Assessment of Speech Transmission Index
Reliance	Reliance Airport Cleaning Services Limited
RFI	radio frequency interference
RHOs	ramp handling operators
RMS	Resources Management System
Rotary	Rotary (International) Limited

S

‘S’ buses	shuttle buses
SAC	Sort Allocation Computer
Safegate	Safegate International AB
SAR	Special Administrative Region
SAS	Stand Allocation System
SAT	site acceptance test
SC	Senior Counsel
SCC	Scheduling Committee Computer
Securair	Securair Limited
SES	Secretary for Economic Services
SESL	Swire Engineering Services Ltd.
Siemens	Siemens AG
SigNET	SigNET (AC) Limited
SITA	Societe Internationale de Telecommunications Aeronautiques
SmarTone	SmarTone Mobile Communications Limited
SRF	Shipment Release Form
SSS	system segment specification
ST1	SuperTerminal 1
STA	scheduled time of arrival
STD	scheduled time of departure

T

TCO	Trucks Control Office
Thai Airways	Thai Airways International Public Company Limited
TMR	Trunk Mobile Radio
TMS	Terminal Management System
TODC	Time of Day Clock
TOP	temporary occupation permit
TU	Timed Updates
TUSC	Twenty-Foot ULD Storage Centre

U

UK	United Kingdom
ULD	unit load device
UPS	uninterrupted power supply
US	United States
USA	United States of America

V

Vanderlande	Vanderlande Industries Hong Kong Ltd.
VHF	Very High Frequency
Virgin	Virgin Atlantic Airways Limited
VIS	Vehicle Information System
VRS	Voice Routing System

W

name of witness followed by “(with)”	Witness who gave evidence together with one or more witnesses
W (followed by a number)	Witness number as called at the public hearing
WB	Works Bureau
WDUM	WUF Data Update Manager – a background computer process which defines the flight information sent to the man machine interface of the Flight Information

	Display System
WHC	Western Harbour Crossing

Y

YDS	YDS Engineering Ltd.
Young's	Young' Engineering Company Limited

Brief Summary

1. The decision to open the new airport on 6 July 1998 for operation was made by the Airport Development Steering Committee ("ADSCOM") in January 1998, after carefully taking into consideration the state of the construction and the development works for the systems and facilities in the Passenger Terminal Building ("PTB") and in the major franchisees' premises and the assurances of Airport Authority ("AA") since about mid-1997 that the new airport would be ready for operation in April 1998. The main determinant for a date later than AA's suggested target of April 1998 was ADSCOM's wish that the new airport would have the full complementary ground transportation provided by the Airport Railway which would only be ready in late June 1998. The decision was approved by the Chief Executive in Council, accepting ADSCOM's views without comment. No political or ulterior consideration was involved in the decision making.

2. The two main culprits for the chaos on airport opening day ("AOD") were the deficiency of the Flight Information Display System ("FIDS") and the breakdown of the Cargo Handling System ("CHS") of the Hong Kong Air Cargo Terminals Ltd ("HACTL") which built SuperTerminal 1 ("ST1").

3. Due to FIDS' difficulties, incorrect and incomplete flight information was provided to all airport users, passengers and airport operators alike. All had difficulty in knowing when a flight would arrive and where it was going to park. This affected and delayed the operations of the ramp handling operators ("RHOs") in serving aircraft and passengers and in unloading baggage and cargo. Passengers and airlines did not know which departure gates were assigned to the flights, especially when such gates were subjected to many changes. Planes were late in both arrival and departure. Passengers were delayed by the flight movements and also by the late arrival of baggage. The means of communication such as the trunk mobile radios and mobile phones which could be and were relied on

by airport operators to obtain the necessary flight information were overloaded. Only about one third of the public telephones were operational. The airbridges linking aircraft and PTB were not always working, and the doors that were supposed to be operated through the access control system from the airbridges to PTB occasionally malfunctioned, causing further delay to both aircraft and passenger movements. A full apron resulted as early as about noon and lasted till about 5 pm, and another one was experienced between 8 and 11 pm. Aircraft had to wait to be provided with a parking stand. Passengers were greatly inconvenienced and anxious while service providers were sweating to cope. All kinds of operators of the new airport were generally unfamiliar with the environment and experienced difficulties in the operation of FIDS, and despite their tremendous efforts, the chaos could not be avoided.

4. HACTL's CHS was operating slowly and inefficiently. The slowness compelled operators to use the manual mode, which could not cope with the workload that the automatic mode would. Operators were not familiar with the manual mode either. The unpreparedness of the operation of CHS was precipitated by the long delays experienced in the construction of ST1, which also cascaded down to delaying the installation, testing and commissioning of CHS equipment and systems as well as the training and familiarisation of HACTL's staff. There was a breakdown of the hand-over procedure that had been agreed between HACTL and RHOs, resulting in a large backlog of inbound cargo being left on the ramp interfacing with HACTL's premises. Not only the customers of HACTL suffered, but Hong Kong's airfreight-forwarding trade also sustained severe losses.

5. A number of other problems which can be considered to be teething and minor would by themselves have only caused minor inconvenience to passengers, freight forwarders and other airport users had FIDS and ST1 been running smoothly. However, the effects of each of the small problems were enhanced, snowballed and spiralled when they interacted with each other and the trouble with FIDS and CHS.

6. AA failed in its duty imposed by the Airport Authority Ordinance that in operating the new airport, it shall have regard to the efficient movement of air passengers, air cargo and aircraft. For the chaos in PTB, AA must therefore be primarily responsible. HACTL is primarily responsible for not being able to provide a cargo handling terminal ready with 75% of its full capacity that it had assured AA and Government. There were progressive delays in the construction and commissioning works in both PTB and ST1, and yet AA's top management did not pay sufficient heed to the risks that various systems were barely ready for operation on AOD. There was no overall risk assessment but only sketchy contingency plans. AA's top management and HACTL were over confident with what they could achieve by AOD, for which not only they but also Hong Kong paid a dear price.

7. Had a deferment been suggested by either AA or HACTL, the chaos could have been avoided by a postponement of AOD by about two months. Unfortunately, no one ever made any such suggestion, and everyone was working diligently but blindly towards the common goal of AOD. FIDS was operating reasonably efficiently about a week after AOD, and the other less serious problems also subsided within a short time. However, it had taken HACTL about six weeks to recover. Although there may still be glitches and hitches, the new airport is now running as a pride of Hong Kong.

Detailed Summary

DECISION TO OPEN THE NEW AIRPORT

1. The decision to open the new airport on 6 July 1998 for operation was made by the Airport Development Steering Committee ("ADSCOM") in January 1998 after carefully taking into consideration the state of the construction and the development works for the systems and facilities in the Passenger Terminal Building ("PTB") and in the major franchisees' premises and the assurances of Airport Authority ("AA") since about mid-1997 that the new airport would be ready for operation in April 1998.

2. AA was established as a statutory corporation by the Airport Authority Ordinance ("the Ordinance") that came into force on 1 December 1995. Under the Ordinance, AA has the functions and duties to provide, operate, develop and maintain an airport for civil aviation. While AA shall conduct its business according to prudent commercial principles, the Ordinance provides that it shall have regard to safety, security, economy and operational efficiency and the safe and efficient movement of aircraft, air passengers and air cargo. AA had to examine and evaluate when the new airport and all the structures, facilities and systems that were required for airport operation would be ready for opening the new airport for operation, in other words, it had to examine and evaluate airport operational readiness ("AOR").

3. Prior to January 1998, the target date for the opening of the new airport had always been scheduled for April 1998, and the works regarding the construction of buildings, the installation of facilities and the commissioning of various systems for the operation of the new airport had been awarded by AA or its predecessor, the Provisional Airport Authority, to contractors with completion dates corresponding to or compatible with April 1998. Similarly, those works regarding the premises of AA's franchisees and business partners whose services were required for the operation of the new

airport would also be completed at such time as to meet the April 1998 target.

4. Under AA's franchise agreements with its franchisees, AA was obliged to give a three-month advance notice to the franchisees of the date of opening of the new airport. ADSCOM was mindful of the importance of fixing an airport opening date well in advance so that the public as well as all concerned parties would know this date for their own planning purposes. It was therefore necessary for ADSCOM to take a decision on a firm airport opening date at least three months ahead of April 1998.

5. As early as October 1995, ADSCOM considered that since the smooth opening of the new airport is essential to Hong Kong, ADSCOM was best placed to be the overall monitor of AOR. ADSCOM's executive arm is the New Airport Projects Co-ordination Office ("NAPCO"). NAPCO's primary duty was to co-ordinate between Government departments which were responsible for the development of seven of the 10 Airport Core Programme ("ACP") projects and the three bodies that were responsible for the development of the remaining three ACP projects, ie, AA in respect of the new airport, Mass Transit Railway Corporation ("MTRC") in respect of the Airport Railway ("AR") and Western Harbour Tunnel Co Ltd in respect of the West Harbour Crossing. ADSCOM also directed NAPCO as its executive arm to monitor the progress of AOR.

6. Towards the end of 1997, ADSCOM asked AA to recommend a date for airport opening. NAPCO assisted ADSCOM by critically examining the progress of AOR critical items, and ADSCOM put details of matters of concern to AA to obtain its comments. ADSCOM was particularly concerned with three matters: (a) when AR would be ready for operation to provide ground transportation to complement the operation of the new airport; (b) the delays in the completion of the construction and system works in PTB; and (c) the slippages in the construction of SuperTerminal 1 ("ST1") to be operated by Hong Kong Air Cargo Terminals Ltd ("HACTL"), the major cargo handling operator at the new airport. AA advised that

PTB would be ready to open for operation in early April 1998. HACTL had given an assurance that it would be ready with 50% of its throughput capacity (which was the required amount in April 1998) by early April 1998. However, considering the delay in ST1's construction works, AA was confident that the new airport would be ready at the end of April 1998, which date it recommended to ADSCOM. On the other hand, MTRC was adamant that AR would only be ready by 21 June 1998, the contractual date of completion, with little hope to advance the date. ADSCOM considered that it was essential for the new airport, as a world-class airport, to be complemented by an efficient ground mass transportation system, as opposed to ground transportation consisting of makeshift arrangements. It decided that 1 July 1998 to be the ceremonial opening day and 6 July 1998 to be the operational opening date ("AOD"). The ceremonial opening day was subsequently altered to 2 July 1998. 6 July 1998 was chosen because it was a Monday, when air traffic would be lighter than other days of the week and road traffic would be lighter the night before. The lighter air traffic would hopefully reduce the duties of operators of the new airport and the light ground traffic. This would facilitate the execution of the enormous relocation exercise to move the equipment, facilities and staff from the Kai Tak airport to the new airport on the Sunday night before AOD. The two months between the original target of April 1998 and AOD would also provide a comfortable float for the completion of necessary AOR works in PTB, and HACTL in particular. HACTL was happy with the added time, and subsequently gave assurances to AA and Government that it would be ready on AOD with 75% of its cargo handling throughput capacity, instead of the 50% throughput by April 1998. On the evidence, the Commissioners conclude that the decision on AOD was proper and wise.

7. The decision was approved by the Chief Executive in Council, accepting ADSCOM's views without comment. There is no evidence before the Commission to indicate that the decision was made with any political or ulterior consideration.

<u>PROBLEMS ON AND SINCE AOD</u>

8. On AOD, numerous problems were encountered, and confusion and chaos ensued. The problems affected man, cargo and machine: there was no efficient movement of air passengers, air cargo or aircraft. Even after AOD, problems continued to occur. The Commission has investigated all the problems that it has been able to identify and made findings as to their causes and where responsibility lies. The problems, which were classified as teething or minor, moderate and major, in accordance with their seriousness and scope, are set out below. The findings of the Commission as to the causes of the problems and the responsibility for them can be found in the appropriate chapters of this report, while Chapter 18 contains a summarised account of all the problems.

Teething or Minor Problems:

[1] Mobile phone service not satisfactory
[2] Trunk Mobile Radio ("TMR") service not satisfactory
[3] Public telephones not working
[4] Escalators breaking down repeatedly
[5] Insufficient or ineffective signage
[6] Slippery and reflective floor
[7] Problems with cleanliness and refuse collection
[8] Automated People Mover ("APM") stoppages
[9] Airport Express ticketing machine malfunctioning
[10] Airport Express delays
[11] Late arrival of tarmac buses
[12] Aircraft parking confusion
[13] Insufficient ramp handling services
[14] Airbridges malfunctioning
[15] No tap water in toilet rooms and tenant areas
[16] No flushing water in toilets
[17] Urinal flushing problems
[18] Toilets too small
[19] Insufficient water, electricity and staff at restaurants
[20] Rats found in the new airport

[21] Emergency services failing to attend to a worker nearly falling into a manhole while working in PTB on 12 August 1998

[22] Traffic accident on 28 August 1998 involving a fire engine, resulting in five firemen being injured

[23] A maintenance worker of Hong Kong Aircraft Engineering Company Limited slipped on the stairs inside the cabin of a Cathay Pacific Airways Limited ("Cathay Pacific") aircraft on 3 September 1998

[24] A power cut occurring on 8 September 1998, trapping passengers in lifts and on the APM as well as delaying two flights

[25] Missed approach by China Eastern Airlines flight MU503 on 1 October 1998

Moderate Problems:

[26] Delay in flight arrival and departure

[27] Malfunctioning of the Access Control System ("ACS")

[28] Airside security risks

[29] Congestion of vehicular traffic and passenger traffic

[30] Insufficient air-conditioning in PTB

[31] Public Address System malfunctioning

[32] Insufficient staff canteens

[33] Radio frequency interference on air traffic control frequency

[34] Aircraft Parking Aid malfunctioning: a Cathay Pacific aircraft was damaged when hitting a passenger jetway during parking on 15 July 1998

[35] An arriving passenger suffering from heart attack not being sent to hospital expeditiously on 11 August 1998

[36] Fire engines driving on the tarmac crossed the path of an arriving aircraft on 25 August 1998

[37] A Hong Kong Airport Services Ltd. tractor crashed into a light goods vehicle, injuring five persons on 6 September 1998

[38] Tyre burst of United Arab Emirates cargo flight EK9881 and runway closures on 12 October 1998

[39] Power outage of ST1 due to the collapse of ceiling suspended bus-bars on 15 October 1998

Major Problems:

[40] Flight Information Display System ("FIDS") malfunctioning
[41] Cargo Handling System ("CHS") malfunctioning
[42] Baggage handling chaos

9. The two main culprits for the chaos on AOD were the deficiency of FIDS and the breakdown of CHS of HACTL.

10. Due to FIDS' difficulties, incorrect and incomplete flight information was provided to all airport users, passengers and airport operators alike. All had difficulty in knowing when a flight would arrive and where it was going to park. This affected and delayed the operations of the ramp handling operators ("RHOs") in serving aircraft and passengers and in unloading baggage and cargo. Passengers and airlines did not know which departure gates were assigned to the flights, especially when such gates were subjected to many changes. Planes were late in both arrival and departure. Passengers were delayed by the flight movements and also by the late arrival of baggage. The means of communication such as TMR and mobile phones which could be and were relied on by airport operators as alternative means of obtaining the necessary flight information were overloaded. Only about one third of the public telephones were operational. The airbridges linking aircraft and PTB were not always working, and the doors that were supposed to be operated through ACS from the airbridges to PTB occasionally malfunctioned, causing further delay to both aircraft and passenger movements. A full apron resulted as early as about noon and lasted till about 5 pm, and another one was experienced between 8 and 11 pm. Aircraft had to wait to be provided with a parking stand. Passengers were greatly inconvenienced and anxious while service providers were sweating to cope. All kinds of operators of the new airport were generally unfamiliar with the environment and experienced difficulties in the operation of FIDS,

and despite their tremendous efforts, the chaos could not be avoided.

11. HACTL's CHS was operating slowly and inefficiently. The slowness compelled operators to use the manual mode, which could not cope with the workload that the automatic mode would. Operators were not familiar with the manual mode either. The unpreparedness of the operation of CHS was precipitated by the long delays experienced in the construction of ST1, which also cascaded down to delaying the installation, testing and commissioning of CHS equipment and systems as well as the training and familiarisation of HACTL's staff. There was a breakdown of the hand-over procedure that had been agreed between HACTL and RHOs, resulting in a large backlog of inbound cargo being left on the ramp interfacing with HACTL's premises. Not only the customers of HACTL suffered, but Hong Kong's airfreight-forwarding trade also sustained severe losses.

12. The baggage handling problem is also a major one, because of its impact on numerous passengers on AOD and the days following. However, had FIDS been operating properly, RHOs' resources and energy could have been focussed on alleviating the baggage problem. The other 39 problems are classified as teething or minor and moderate. Some of them were isolated incidents, and did not contribute to the chaos on AOD. The others would by themselves have only caused minor inconvenience to passengers, freight forwarders and other airport users had FIDS and ST1 been running smoothly. However, the effects of each of the small problems were enhanced, snowballed and spiralled when they interacted with each other and the trouble caused by FIDS and CHS, to the extent that nobody could have reasonably anticipated.

THE KEY RESPONSIBLE PARTIES

13. The main cause of the inefficient operation of FIDS was the problems with the FIDS software, giving rise to slow response time and causing great difficulty to the operators of FIDS on AOD. The

lack of training on the part of the operators was also a major contributing factor. The root cause of all these was the lack of time. Due to delays in the development of FIDS, software development time, testing time as well as training time had all been compressed. There is insufficient evidence for the Commission to decide whether it was AA or its contractor and subcontractors for FIDS that should be responsible for the delays. For the software problems, Electronic Data Systems Ltd., the subcontractor providing the software, should be responsible. AA should mainly be responsible for the failure to have its operators properly trained.

14. The delays in development of the software at the early stage was mainly caused by the lack of co-ordination between AA's Project Division ("PD") led by W43 Mr Douglas Edwin Oakervee and Airport Management Division ("AMD") of which W44 Mr Chern Heed is the director. There were also other instances of lack of co-ordination, the most important of all was AMD and the Information Technology ("IT") Department headed by W45 Mr Kironmoy Chatterjee failing to effectively arrange the staff of the subcontractors for the software of FIDS (inclusive of the Terminal Management System) and IT Department to timely attend the Apron Control Centre to assist the operators there when help was most needed, although such staff were present in other parts of PTB. For this lack of co-ordination, W44 Heed and W45 Chatterjee should be responsible. W45 Chatterjee also failed to advise AMD of the risk of deferring the stress and load tests of FIDS.

15. Though there were risks involved in using FIDS on AOD, W44 Heed did not make any global contingency plan or have an overall risk assessment. W44 Heed should be responsible on this account.

16. For the chaos in PTB on AOD and the days after, W44 Heed as AMD Director must be primarily responsible. W3 Dr Henry Duane Townsend, as the Chief Executive Officer ("CEO"), should also be responsible. He is further found to be responsible for not co-ordinating AMD and PD as the CEO.

17. The Commission also finds that the lack of co-ordination between

AMD and PD was probably caused by the personalities and characters of those occupying the posts as directors of these two divisions as well as the CEO. W3 Townsend did not give sufficient priority to the operational requirements of AMD, and did not give adequate support to W44 Heed.

18. AA as a whole failed in the duty imposed on it by the Ordinance to have sufficiently regard to the efficient movement of air passengers, air cargo and aircraft in operating the new airport. As to the chaos in PTB, despite the responsibility of W44 Heed and W3 Townsend for the same matter, the AA Board must bear the ultimate responsibility, because the Ordinance has imposed the duty on it, although it has power to and did delegate that duty to the CEO and the AA management.

19. The evidence shows that W3 Townsend had made two misstatements to ADSCOM, one on paper and the other orally. The written misrepresentation was that FIDS was, as a whole, 98.7% reliable, and the oral one was that ACS had been successfully tested. The Commissioners do not have sufficient evidence to conclude that the misstatements were uttered with intent to mislead, but ADSCOM was in fact misled. For these misstatements, W3 Townsend must be responsible. W45 Chatterjee is found to be grossly negligent in not disabusing ADSCOM of the misstatement on FIDS, but is not found responsible regarding ACS. W44 Heed's attitude that he would not bother if ADSCOM was misled betrayed the trust that ADSCOM reposed in him, and exposed a weakness in his integrity.

20. The top management of AA was over-confident in what they could achieve, and were too busy to step aside to look at the risks involved. As a result they assured ADSCOM that the new airport would be ready.

21. The root cause of ST1's paralysis, similar to the cause of FIDS' deficiency, is also the lack of time. There were progressive delays in the construction and commissioning works in ST1, compressing the time for testing and for training of operators. There is

insufficient evidence as to whether HACTL or its main contractor and subcontractors were responsible for the delays.

22. The Commission finds that probably the main cause of the breakdown of HACTL's CHS was the problems with the integration between the Logistic Control System and the mechatronics of the Container Storage System and the Box Storage System. The operators were also not trained well enough to operate CHS in manual mode.

23. HACTL is primarily responsible for not being able to provide a cargo handling terminal ready with 75% of its full throughput capacity that it had assured AA and Government. HACTL was also over-confident in CHS that they had developed.

24. AA should also have monitored the readiness of HACTL. While AA had professionals to check on the physical construction side of the works carried on in ST1, it did not have any expertise to effectively monitor CHS. AA therefore did not have sufficient regard to the efficient movement of air cargo in preparing the new airport for operation and should be responsible.

25. NAPCO was the overall monitor of AOR. It should have critically examined and evaluated AOR critical issues, including the readiness of PTB and ST1 in effecting the efficient movement of air passengers, aircraft and air cargo. In discharging these functions, NAPCO committed two errors: (a) assuming that AA had the necessary expertise to monitor HACTL's CHS, without even asking AA if it actually had the expertise; and (b) failing to critically examine the contingency plans of AA and to query if it had made an overall risk assessment.

26. NAPCO therefore failed to discharge its duties as the overall monitor of AOR in its position as the executive arm of ADSCOM and as directed by ADSCOM. However, as ADSCOM itself was the overall monitor of AOR, it is ultimately responsible for the duties of such an overall monitor not having been satisfactorily discharged by NAPCO.

27. Both AA and HACTL were too confident to appreciate the risks involved in the compression of their testing and training time. They never sought any postponement of AOD. Had a deferment been suggested by either AA or HACTL, the chaos could have been avoided by a postponement of AOD by about two months. Unfortunately, no one ever made any such suggestion, and everyone was working diligently but blindly towards the common goal of AOD.

28. FIDS was operating reasonably efficiently about a week after AOD, and the other less serious problems also subsided within a short time. On the other hand, it had taken HACTL about six weeks to recover. Although there may still be glitches and hitches, the new airport is now running as a pride of Hong Kong.

CHAPTER 1

INTRODUCTION AND ACKNOWLEDGEMENT

1.1 On 2 July 1998, the day following the first anniversary of the reunification of Hong Kong with the People's Republic of China, the new Hong Kong International Airport ("the new airport") at Chek Lap Kok ("CLK") was opened by our President Jiang Zemin. The publicity of the new airport was further enhanced by the departure of Air Force One with the President of the United States of America on board on the same day, although the Hong Kong International Airport at Kai Tak ("the Kai Tak airport") was still operating. The Kai Tak airport was to be replaced by the new airport which was due to open for operation four days after the ceremonial opening.

1.2 Since China's resumption of exercise of sovereignty over Hong Kong a year ago, people in the Hong Kong Special Administrative Region have become generally more interested in this place in which they live and work, as evidenced by the record turnout for the election of the Legislative Council that took place on 24 May 1998. The building of the new airport as well as its ground transportation support systems and the infrastructure items connected with them were complete. These projects had taken many years of planning and preparation and involved the largest sum that was ever expended in Hong Kong's history. While many members of the public went to the Kai Tak airport to have a last glimpse of it and used the camera to retain their memory before it would be closed, many more paid visits to the new airport to obtain a personal feeling of it. Most of those who roamed around the new airport and those who followed the media coverage on it were impressed with its size and the spaciousness of the Passenger Terminal Building ("PTB") and rightly so, because PTB is the largest single air terminal building in the whole world. They entertained little doubt that the services the new airport offered would be better than those available at the Kai Tak airport. It is with this kind of expectation that the public and members of the media were looking forward to the operational opening of the new airport on 6 July 1998. The dark cloud of economic downturn that stemmed from some South East Asian countries and Japan had spread over Hong Kong; the opening of the new airport was a silver lining that everyone was anticipating, at least as a booster of confidence that Hong Kong would have an early recovery.

1.3 There was a huge relocation exercise in the night between 5 and 6 July for moving personnel and equipment from Kai Tak to CLK. This was a tremendous task, involving an enormous amount of planning, preparation and organisation, counting on the weather being not too difficult, relying heavily on the coordination and cooperation amongst members of the airport community, and hoping that the public would not participate in such a manner as to cause disruption. The electronic media reflected public interest in the new airport by televising many parts of the process, which contributed towards keeping interested persons at home instead of going out into the way of the move. Everything went on smoothly and nothing appeared to give rise to any worry to the public. The expectation that the new airport would be a great success was elevated.

1.4 In the morning news on 6 July 1998, a couple on the first arriving flight were shown on the television, being welcomed to Hong Kong and given souvenirs to commemorate their being the first arrivals at the new airport. Later in the day, however, there was news that passengers had to wait for a long time to get their baggage, that baggage and air cargo processing was delayed, and that there was congestion in PTB and the areas around. Everything did not seem that well after all. On the following days, the media extensively reported the problems experienced by passengers, visitors as well as cargo consignors and consignees. Hong Kong people’s great expectation with the linked auspice of an early economic recovery was dashed.

1.5 For many days, media coverage identified various problems and reported incessant criticisms, culminating in an outcry that there must be an investigation of the “fiasco” that blemished Hong Kong’s reputation as the Asian hub of civil aviation and damaged the business of the air import and export trades. As a result, the Government, the Legislature as well as the Ombudsman each announced that an inquiry would be held.

The Commission of Inquiry on the New Airport ("the Commission") was thus established on 21 July 1998.

1.6 The Commission was given six months within which to report its findings and conclusions to the Chief Executive. Since the date of their appointment, the two Commissioners and the Secretary to the Commission, Mrs Marion LAI CHAN Chi Kuen, started work without any delay. Mr Benjamin YU SC, Mr JAT Sew Tong and Ms Yvonne CHENG were appointed as counsel for the Commission, and Messrs Baker & McKenzie as solicitors. Many meetings were held to consider various matters necessary to initiate and proceed with the inquiry, including the selection of experts to assist the Commission, the approach to identifying the problems with the new airport and obtaining documents and evidence from various persons or organisations that might be involved. Media reporting was screened to help in identifying the problems. Apart from sending out letters to various persons or organisations to seek information, a hotline was set up to receive evidence from the public and interested parties. Eventually four experts, Professor Vincent Yun SHEN, Mr Jason G YUEN, Professor Xiren CAO and Dr Ulrich Kipper were appointed and they duly participated in the inquiry whenever necessary.

1.7 Starting from 14 August 1998, three preliminary hearings of the inquiry were held for various procedural purposes such as arranging for the persons or organisations who so wished to be made parties to the proceedings, dealing with legal representation of the parties, and giving directions on witness statements, order of examination of witnesses, documents to be used at the hearing, confidentiality of such documents, and recording of the proceedings, etc. The hearing of evidence started on 7 September 1998 and concluded on 11 December 1998 and counsel's replies were heard until the last day of the year. Altogether 61 days were spent for the hearing, both on preliminary and substantive matters. The parties with a short description of their interest or involvement are listed in **Appendix I** to this report, whereas their legal representatives can be found in **Appendix II**. The experts appointed by the Commission and the parties are set out in **Appendix III**.

1.8 In response to the request of the Commission, around 800 box files, containing about 500 pages each, of documents were delivered to the Commission. The Commission also received 245 witness statements including supplemental statements, some of which were from persons not based in Hong Kong. The witness statements from the parties who were legally represented were all prepared by or with the assistance of their lawyers. Although there were occasions when parties or witnesses provided their statements slightly beyond the Commission's prescribed time, which was tight on all accounts, the documentary evidence was overall supplied expeditiously. Counsel and solicitors for the parties were restrained in asking questions of the witnesses called, so that the number and length of such questions were kept to the minimum required in the circumstances. All these were very important in view of the time given to the Commission to complete its inquiry. The Commission is most grateful for the assistance and cooperation of the parties and their legal representatives, as well as the organisations and persons who supplied witness statements and information from overseas in such limited time, without which this report would not have been ready so soon.

1.9Through the hotline, e-mail and post, about 100 persons supplied information and lodged complaints about the problems encountered at the opening of the new airport. The Commission is thankful to their contribution. Before and during the hearing, the Commission made several visits to various parts of the new airport. Each time, the Airport Authority and some of the parties made all necessary arrangements to facilitate access and direct the attention of the Commission to matters in issue or of interest, for which the Commission is obliged to them.

1.10 The Commission also acknowledges its debt to members of the media. The media gave wide coverage to the problems faced by the new airport and dealt with the hearing of the inquiry in no lighter manner. These, though not easily noticeable, not only helped the Commission in identifying the problems and occasionally the parties, but also enabled the public to be made aware of the evidence received by the Commission on each day of the hearing. The latter aspect is very important, for the process and progress of the Commission's work was given a certain degree of transparency.

1.11 The Commission is very pleased with the Legislative Council Select Committee and the Ombudsman, who were separately conducting their own inquiries into the new airport, for having arranged the order of receiving evidence from the witnesses who were required to attend the Commission's inquiry in such a manner as not to cause any disruption to the Commission's hearing, let alone not to make life difficult for the witnesses.

1.12 During the past six months, Mrs Marion LAI and her staff in the Secretariat, all legal representatives for the Commission and all the experts were working very hard, often staying in the office late in the evening during Mondays to Saturdays, and frequently on Sundays. Without their dedication and exemplary diligence, the work of the Commission would have been impossible. To each and everyone of them, the Commission expresses admiration and gratitude.

CHAPTER 2

TERMS OF REFERENCE

2.1 The two Commissioners were appointed on 21 July 1998 by the Chief Executive in Council under the Commissions of Inquiry Ordinance, Chapter 86 of the Laws of Hong Kong, to inquire into the operation of the new airport and the problems encountered since it opened with the following terms of reference:

(1) To examine the planning and preparation for the opening of the new airport including the adequacy of communication and coordination between all interested parties.

(2) To examine the decision to open the new airport on 6 July 1998 and the extent to which it was ready to begin operation on that date.

(3) To examine the operation of the new airport since it opened on 6 July 1998 (including but not limited to flight information display system, franchised air cargo services, ramp handling and baggage handling and airside security) and to identify the roles of the various parties involved.

(4) To identify problems encountered in the operation of the new airport and to establish their causes and where the responsibility for each of them lies.

(5) To report to the Chief Executive with findings and conclusions within 6 months of the date of appointment or such time as the Chief Executive in Council may allow.

2.2 The Chief Executive in Council directed that the civil liability of any party for any loss or damage and its quantification should be outside the terms of reference of the Commission.

2.3 The Commission was empowered to appoint experts to provide reports on any matters covered by the inquiry.

CHAPTER 3

METHODOLOGY, CRITERIA AND TREATMENT OF EVIDENCE

Section 1 : Methodology

3.1 The Commission appreciated from the terms of reference that it had to inquire into and examine a number of main issues, namely,

(a) whether the decision to open the new airport on 6 July was made correctly or properly when it was made;

(b) what planning and preparation was made to open the new airport, including the adequacy of communication and coordination between all interested parties;

(c) whether the new airport was ready for operation on 6 July 1998, the airport opening day ("AOD");

(d) what problems were encountered in the operation of the new airport on AOD and thereafter;

(e) the cause or causes for such problems;

(f) the roles played by various involved parties; and

(g) the identity of the persons or bodies who were responsible for the problems.

3.2 Though the decision on AOD can be treated as a separate topic, whether it was correctly and properly made is connected with the readiness of the new airport being operational on that day and the problems encountered then and thereafter. The remaining subject matters of the inquiry involve a very wide scope, not only because the new airport was a mammoth project involving the construction of many buildings, structures and facilities, but the readiness of its opening would also necessitate the examination of the efficiency of the operation of a number of services. The Commissioners decided at the outset that the first step to be undertaken was to identify the problems encountered at the opening. Once the problems were identified, the Commission would investigate the causes for them and the roles played by various interested parties, whereby the persons responsible could be found. The problems themselves and their causes would enable the Commission to come to a conclusion whether the new airport was ready to open for operation on AOD, and if not, whether the communication and coordination of the persons making the planning and preparation were adequate, and whether the decision on AOD was proper or correct in the circumstances.

3.3 For identifying the problems and the possible persons that might have information on the areas in which the problems occurred, the Commission would first consult media reports as from AOD. Those persons so identified would be asked about the causes for the problems, first through correspondence, and when allegations as to the causes had been received, the Commission would seek witness statements and relevant documents from those from whom the allegations stemmed. The Commission would then set up hearings for oral testimony to be received so as to enable any person or organisation who might be implicated by the allegations to put forward his or its case and refute any such allegations. The hearing was to be conducted in public so that all the evidence that needed to be dealt with would be thrashed out in public, and the whole process of how the Commission reached its findings and conclusions on all issues would be transparent.

3.4 The areas to be covered by the inquiry were quite wide, if not for any other reason, mainly because the problems in the operation of the new airport on AOD and thereafter as reported continuously by the media were quite numerous.

3.5 With the above approach in mind, the Commission set in train the following steps:

(a) Gathering as much information as possible about the issues within its terms of reference from media reports;

(b) Writing letters to various persons or organisations mentioned in the media reports or who might be involved regarding each of the problems, seeking information and documents about the existence of the problems, the causes of the problems and the roles played by them regarding the problems;

(c) Appointing counsel and solicitors to deal with matters in (b), and also to prepare for the hearing of evidence to be held by the Commission;

(d) Trying to identify from all the information received the areas on which expert assistance would be needed by the Commission, for understanding the issues and for expert opinions on technical and scientific issues to be provided; and

(e) Getting and setting up a venue for the hearing of evidence to be conducted by the Commission.

3.6 It is necessary to elaborate on each of the steps mentioned in the preceding paragraph, except perhaps the venue. The venue was acquired by the Secretariat in accordance with the size and set-up as required by the Chairman of the Commission who had the experience of having conducted the Garley Building Fire inquiry in 1997. Although the large number of parties who were interested in participating in the hearing was not anticipated, the size of the venue was fortunately just sufficient to house the teams of legal representatives retained by the parties and members of the public including the media.

3.7 The Commissioners were appointed on 21 July 1998, about two weeks after AOD. In this intervening period, there was extensive coverage by the media of the problems encountered in the operation of the new airport and that was a good starting point in the Commission's operation. The problems identified with the help of the media reports would enable the Commission to commence a train of paper inquiries with the persons or organisations who might also have been identified by the media reports or who the Commission, with the assistance of the Secretariat, counsel and solicitors, thought might be involved. The responses and documents supplied by the various persons explained the roles played by themselves or provided information to the Commission as to other persons who were or might be involved. All such persons or organisations would then be required to provide witness statements of people who had personal or indirect evidence on the issues.

3.8 Although the process of sending inquiry letters was used initially for preparation of the hearing, it was also employed for apprising the parties and non-parties to the hearing of the allegations or possible allegations against them. The Inquiry started with only some problems as identified by media reports and the first batch of inquiry letters were sent to organisations that were thought to be able to explain the problems and provide information about the causes and the persons responsible therefor. When answers with allegations of the causes and the persons responsible were received, other inquiry letters were sent to these alleged persons, so that these persons were given a chance to respond and more information could be extracted. The process of paper inquiry, seeking information and witness statements, and putting forward allegations and possible allegations for the addressees to respond, went on almost up to the conclusion of the entire hearing.

3.9 The importance of having a hearing of evidence cannot be over-emphasised. The person against whom allegations have been made must, to be fair to him, be given an opportunity to answer such allegations and put forward his own case as to what exactly happened and how and why he is not or should not be responsible. The hearing has to be conducted in public, so that all the evidence relating to any person or any issue will be disclosed for public scrutiny, ensuring that justice must not only be done but must be perceived by the public to be done. The hearing is to be conducted in similar manner as a court trial in which witnesses are to give evidence, either by way of oral testimony or by producing documents to help establish what they have to say. The witness will be cross-examined by any party who takes any issue with him or seeks to establish something favourable to that party, and by counsel for the Commission in order for the Commission to get at the truth and raise matters of concern. Although the Commission is appointed by the Chief Executive in Council, it is important to appreciate that the Commission was in fact conducting an inquiry on a matter of public concern, and the public interest was what the Commissioners as well as counsel for the Commission had to bear in mind, and always bore in mind.

3.10 The duties of counsel appointed by the Commission were onerous. Not only did they have to prepare the inquiry letters and make further inquiries arising from the responses to such letters, they had to prepare for the examination of the witnesses at the open hearing. It has to be clearly stated, for avoidance of any misunderstanding, that counsel were not involved in any decision making of the Commission, in that the findings and conclusions of the Commission were reached independently of counsel's views, and for that matter, independently of any other person's. Nonetheless, the views of counsel for the Commission, those of counsel for the parties who had addressed the Commission, those of the experts appointed by the Commission and the parties, as well as those of the witnesses and the representations of the parties had all been considered before the Commission arrived at its findings and conclusions.

3.11 During the course of receiving information from various persons and organisations, the Commission was able to get some idea as to the areas that would involve technical and scientific knowledge, on which expert's assistance would be needed. As a result, four experts were appointed for the Commission. Their brief curricula vitae can be found in **Appendix III**. Professor Xiren CAO of the Hong Kong University of Science and Technology is an expert on mechatronics, mainly to look into problems alleged by Hong Kong Air Cargo Terminals Limited ("HACTL"), one of the two cargo operators franchised to operate as such at the new airport, to be related to the mechanical, electrical and electronic equipment of HACTL. Professor Vincent Yun SHEN from the same university is an information technology ("IT") expert who was to examine problems that were encountered by the Flight Information Display System installed at the new airport, and also the problems that might have occurred with HACTL's computer system. Mr Jason G YUEN, an airport expert from San Francisco Airport, USA, scrutinised the planning, preparation, communication and coordination necessary for the opening of the new airport, obviously from the American perspective. Dr Ulrich Kipper is an IT expert with the added advantage of having been applying his knowledge of IT in airport operations. He is from the Frankfurt Airport in which he is employed and from which he normally operates. He also had the assistance of Dr Markus Leins, a fellow colleague specialised in IT at the Frankfurt Airport. The participation of Dr Kipper with Dr Leins as an expert in the inquiry is to straddle between the fields covered by Professor Shen and Mr Yuen, as well as to provide input from a European angle. While Professor Shen and Professor Cao helped the Commission in understanding technical and scientific issues, the contributions from Mr Yuen and Dr Kipper enabled the Commissioners to widen their horizons in looking at the issues to be determined by them in a more cosmopolitan and international manner.

3.12 Shortly after its appointment, when the Commission started to gather information about the problems encountered on AOD, it realised from media reports that the problems facing the operation of the new airport were quite numerous, and many of them were still surfacing. The Commission was concerned about the sufficiency of the time within which they should complete their work in inquiring into all the problems and the depth of their examination of the causes for the problems. Due to the terms of reference that the Commission had to inquire into "the problems encountered since (the new airport) opened", it appeared that the inquiry to be conducted was to be an on-going and never-ending exercise if some problems crept up every now and then during the course of the inquiry till 20 January 1999 when the Commission's report is due.

This must be the case on a strict interpretation of the terms of reference, but the deadline for the submission of the report would in no circumstances allow that course being taken. The Commissioners felt, therefore, that as they were given a fixed period within which to report their findings and conclusions to the Chief Executive, there must be a self-imposed end to their inquiry. The Commission would investigate a problem that occurred after their appointment, as opposed to those that were known before, if the problem was considered to be of significance, but on the other hand, it would not deal with any other post-appointment problem in any great detail.

3.13 Item (4) of the terms of reference requires the Commission to identify the problems encountered in the operation of the new airport and to establish their causes and where the responsibility for each of them lies. Thus, it is clear that the Commission has to inquire into the causes for the problems and the responsibility for such causes. Upon examination of some of the documents obtained by the Commission from various concerned parties, one vexing question immediately surfaced. The question is: what is the extent to which the Commission should go in inquiring into such causes and responsibility? In the normal circumstances of a court trial, the court entrusted with such a task will certainly have to get to the root of the problem, thereby finding the causes and attribute the responsibility to one or the other of the parties to the suit. In most court cases relating to contractual liabilities, the court will make findings as to which of the contracting parties, who are invariably parties to the proceedings, is liable to the other party or parties. In most cases relating to claims of tortious liability, the court will conclude on whom the liability lies, and if more than one person is liable, the court will apportion the blame. However, the Chief Executive in Council expressly directs that "civil liability of any party for any loss or damage and its quantification shall be outside the terms of reference of the Commission". In view of this express direction, the tasks of the Commission seem to be lighter than that of the courts in their resolution of disputes between parties to civil litigation. Moreover, the Commission is required by item (5) of the terms of reference "to report to the Chief Executive with findings and conclusions within 6 months of" its appointment "or such time as the Chief Executive in Council may allow". Although there is always a possibility that the inquiry entrusted to the

Commission cannot be completed with findings and conclusions within six months of its appointment, it is appreciated that unless there are very cogent reasons, the given time limit should be adhered to. This is obvious for at least two reasons. The request for extension of time should be properly seen as only providing a safety measure to cater for any circumstances unforeseen by the Chief Executive in Council, but otherwise the Commission is required to complete its tasks within six months. The time limit must have taken into consideration the public's concern in the matter under inquiry, so that the Commission has to finalise its tasks with dispatch for the public to be apprised of what was going on with the new airport at its opening within a reasonable time frame.

3.14 Many problems encountered at the opening of the airport require examination of voluminous documentation, detailed understanding of the problems and discernment of where the truth lies through accounts by various parties who were involved. Such accounts comprise answers provided to questions posed by the Commission's counsel in letters or in the examination of witnesses. The parties were invariably linked by contracts for their basic relationship, and which party was responsible for the performance of certain obligations in the contract could normally be determined by the true interpretation of the contract itself. However, there are at least two obstacles to make the determination of the cause and responsibility difficult, namely,

(a) A party to a contract alleges that the other party to the contract is responsible for the problem inquired into by the Commission because the other party had breached a contractual obligation owed by the other party, whereby causing delay or difficulty to it resulting in its failure to ensure that the problem would not arise. The other party claims that its breach of obligation was in turn caused by the first party in failing to perform another obligation under the same contract. This kind of allegation of breach of a prior obligation can go on several times between the two parties, going round a circle of cause and consequence. The determination of such disputes is very time-consuming. Although this kind of circles of obligations frequently appears in normal civil litigation before the courts, the courts have little time constraint in resolving the dispute to arrive at a final decision. As an example, a building contract dispute will need a number of months or even years of hearing by the court before a final decision can be reached. The Commission's position differs in that the Commission had to operate in a limited time scope.

(b) One of the two contracting parties makes various allegations against the other contracting party (the second party), and the second party blames the non-performance of an obligation of a third party in another contract between the second party and the third party. The allegations may go on for several layers to link a fourth and even more subsequent parties. Again, this dragging in of parties as to be the culprit for the event that caused the damage often happens in normal civil litigation, and the courts are able to reach a conclusion after a lengthy trial. However, the Commission did not have the luxury of time.

3.15 The Commission therefore had to decide on the extent to which its inquiry should attempt, or else there would be no hope for the inquiry to be completed within the time allowed. Based on the answers to queries raised by the Commission addressed to various parties, the Commission had a general appreciation and understanding of the problems and the allegations of the concerned parties. These allegations related closely to the causes of the problems and the responsible persons or parties. Bearing in mind the time required for receiving oral testimony to allow the parties to have a fair hearing, the Commission was constrained to impose a stop to the length of its inquiry by setting targets on the extent of the inquiry. The limitation of this approach is that the findings and conclusions on the causes for the problems and responsibility for such causes might not be too definite in that

(a) although the causes for a problem encountered could be identified, the exact root of the problem might not be found; and

(b) the responsibility for the causes could not be definitely determined as to be attributable to a party, but rather two and more parties might be identified as the culprits with no apportionment of blame, or the responsibility might lie on one or two or more parties and there is no conclusion as to which particular one.

3.16 The Commission has realised all along that its findings and conclusions with the above-mentioned limitation or disadvantages are not too satisfactory either for the Chief Executive to whom the Commission is to report or for the public if the Commission's report is released generally. However, due to the time requirement and the express direction that they are not to investigate the civil liability of the concerned parties, the Commissioners feel that the self-imposed extent of the inquiry is the proper and appropriate approach and it is the best they can do in the circumstances. Further, the Commission is not entrusted with the task of finding solutions for the problems. Fortunately, most if not all of the problems have been rectified and those that still remain are subject to urgent and earnest remedies, the Commission's inability to get at the root of the problems would have little adverse consequence. The definite identification of the culprit, which would be very relevant for the attachment of civil liability, could be left to the courts or arbitration which will be resorted to by the concerned parties. After all, section 7 of the Commissions of Inquiry Ordinance clearly provides that

> "Evidence given by any person before the Commission shall not be admissible against him in any civil or criminal proceedings by or against him, except where he is charged with any offence under Part V (Perjury) of the Crimes Ordinance (Cap. 200) or is proceeded against under section 8 or 9 [contempt]."

3.17 The inability of the Commission in making definitive findings of the responsibility of a party in no way hinders any civil or arbitration proceedings amongst the concerned parties, even though admittedly it would create a feeling of dissatisfaction on the reader of the Commission's report that he cannot see a perfect, instead of a partial, ending of a narrated story.

3.18 The Commissioners find consonance of parts of their above views in the Victorian Communism Commission (1949) Report (Australia) page 7, where Commissioner Lowe said:

> "I should not treat the matters investigated before merely as a piece of litigation between parties in which findings should be made on the evidence in favour of one party or the other, but as matters in which the Executive desires to know, not merely what I find proved by the evidence, but also what the evidence does not satisfactorily determine and which I think may nevertheless be possibly true. In what follows there are some matters in which I am able to say on the evidence are in accordance with the allegation, and some others which I am able to say are not in accordance with the allegation, but there are a number of matters which all I can say is that I am not satisfied on the evidence that the allegation is true. Such a finding is not intended to be, and must not be taken to be, equivalent of finding 'not guilty'. It indicates only that I think I have not been able to discover what the truth is, and that further evidence may show the allegation to be true or untrue."

3.19 Many points and arguments were raised by the parties and their counsel and counsel for the Commission, obviously to look after the parties' interests and to assist the Commission in reaching fair and reasonable conclusions. While the Commission has dealt with many of these propositions and arguments in the report, numerous such points have not been expressly mentioned. This approach of the Commission must not be taken as its failing to pay attention to or consider all such ideas. The reasons for not stating them are many. This report is unlike a court judgment where all arguments of counsel are often expressly considered, for otherwise the report would give the reader, who is not necessarily a person trained in the law, a view of too many trees but not a forest. It would also be too burdensome on the Commissioners who should bear firmly in mind the necessity of stating their findings in an expeditious manner. Many points though examined may not lead to any definite conclusions, because the evidence obtained by the Commission is not sufficient to enable it to reach a firm view. Some arguments presented are not rational and if stated would simply need to be dismissed. Other unaccepted or rejected arguments may, on the other hand, require lengthy analysis and recital of a number of items of the evidence to show why they are specious or unsound, and their relative unimportance does not warrant the increase in the complexity and volume of the report. A report consisting of all such matters would certainly be confusing to the reader and clouding the main and important issues that Commissioners ought to decide and have determined. It must, however, be stressed that an argument or point or evidence which has not been stated in this report should not be taken as it having not been considered.

Section 2 : Concerned Parties' Role, Responsibility and Liability

3.20 The role that a person or organisation plays in an activity is always a ready and important guide to his or its involvement in that activity. The involvement will point to the area of duty or obligation. The obligation may arise out of contract, or it may not. An obligation under contract is defined by law and a breach of the obligation will give rise to civil liability. Another way that may attract civil liability is the commission of an act or omission proscribed by the law of torts. As the Commission is tasked by its terms of reference not to make any finding as to civil liability, the Commission's findings and conclusions are on the roles, acts and omissions of the concerned parties to find out the party responsible, with or without reference to legal positions under the laws of contract or torts. Despite that limitation of the Commission's purview, it is sometimes necessary to look into the legal position of a party. For example, if there is a statute governing the status and activities of a party, such as the Airport Authority Ordinance ("the Ordinance") establishing the Airport Authority ("AA"), or if there is a contract whereby the party's obligations are defined, the legal position of the party in accordance with the Ordinance and the contract can thus be ascertained. However, the Commission has also examined other matters not necessarily relating to the laws of contract and torts in order to base their findings of responsibility, such as whether there was sufficient coordination or communication, or whether a certain work should have been accepted under the particular circumstances. These matters do not have any implications on contractual or tortious liability, but they are relevant to the question of responsibility that the Commission has to determine.

3.21 Most of the roles of the parties arose out of contract. In constructing the new airport and providing it with various facilities, AA had to employ numerous contractors. Many contractors appointed subcontractors, splitting the responsibility for performing the works under the main contract or franchise that was granted to them by AA. There were even sub-subcontractors appointed by subcontractors. On the other hand, the roles of the Airport Development Steering Committee ("ADSCOM") and the New Airport Projects Coordination Office ("NAPCO") are mainly not contractually based. For the Government entrusted works that AA and its franchisees were to perform, the relationship may be contractual, but in respect of ADSCOM's decision on AOD and NAPCO's monitoring role over AA, that was purely a matter of administration of Government. These various roles and relationships were carefully examined by the Commission. However, responsibility is not only related to the roles of the concerned parties, but it also hinges on the causes for the problems.

Section 3 : Resolution of Issues

3.22 For ascertaining the causes of the problems encountered at the new airport, the Commission needs to determine the issues raised by various parties to the hearing and non-parties. Such issues were raised by way of representations presented to the Commission, in the oral testimonies received during the hearing, or in the examination of such testimonies. Similarly, the issues on responsibility were raised by written representations or through oral evidence.

3.23 All parties to the Commission's hearing and non-parties who were implicated by any allegations were provided with opportunities to answer such allegations and present their own case. Although many issues were identified at the early stage of the inquiry, not a small number of issues only became apparent during the oral testimonies of witnesses at the hearing or when answers to inquiry letters sent by the Commission were received. In order to ensure that the length of the hearing was kept to a manageable extent, numerous inquiry letters were sent, pointing out allegations raised by parties or areas of concern of the Commission, so that the concerned person or body could respond. For the purpose of further ensuring fairness to the persons against whom criticisms might be made, on 14 December 1998, three days after the conclusion of oral evidence, the Commission issued a broad outline of possible allegations against parties and non-parties for their consideration. This broad outline was separate and independent from the final written submissions of counsel for the Commission and for the parties, and those who wished to make any representations and submissions to respond to the broad outline were allowed to do so.

3.24 A copy each of the final written submissions of the parties were provided to the other parties in the evening of 21 December 1998, and thenceforth they were also made available to members of the media. This was to ensure transparency since the submissions were not read out openly at a hearing. The non-parties were also allowed to inspect these submissions and respond thereto.

3.25 As is said above, the roles of the parties involved can be more readily ascertained. However the issues and allegations raised by the parties and non-parties on cause and responsibility are numerous, and sometimes extremely involved. For example, the air-conditioning system, which did not operate efficiently or without fault, is a conglomeration of the work of a number of parties, from providing the design to supplying the various equipment and systems. Correspondence making representations by various parties and non-parties on the issues raised is voluminous, which makes determination of cause and responsibility difficult. Even in a simpler matter that is covered by a single contract with only two parties and where allegations are conflicting, determination is not rendered any easier. The reason is the time within which the Commission has to finalise its inquiry. In view of the importance of enabling the public to be apprised of the Commission's findings on cause and responsibility in a relatively short period, the Commission at the early stage of the inquiry decided on its approach not to get to the root of the causes or the ultimate responsibility of interested parties wherever time did not permit. A more detailed discussion of this can be found in paragraphs 3.12 to 3.16 above. The situation of the inquiry is thus very different from that of a normal civil suit, where issues are crystallised by pleadings or through interlocutory proceedings, and parties are allowed to call their own witnesses at the trial. The witnesses are examined thoroughly in court and conflicting evidence can be determined after hearing the witnesses. Even where evidence is conflicting and there is no material supporting one version or the other, and other rational bases for determining the issue being equal, the court can as a last resort decide the issue upon observation of the witnesses' demeanours. Due to the time constraint, not all persons who had made conflicting allegations were called, and the Commission was deprived of the opportunity to observe the demeanour of witnesses. Besides, the Commission has been cautious to uphold an important principle which is that no person should be condemned until he has a chance to be heard. The best way to test the allegations is to put them to a witness called by one of the involved parties, so that he may answer on behalf of the party. By this method, the witness is given a chance to proffer whatever explanations he deems necessary and his demeanour in the witness box will be examined by the adjudicator. This avenue, however, was not always open to the Commission wherever the seriousness or otherwise of the problem to which the evidence would relate did not warrant a considerable amount of hearing time being spent. In such circumstances, it is difficult, if not impossible, to find out the precise cause for the problem on which the concerned parties had made conflicting allegations or which of the parties who made such allegations should be responsible for the fault. Notwithstanding the limitation, the Commission has considered all the relevant materials and analysed the situations very carefully to reach its views and findings.

3.26 There is an instance where an allegation or its seriousness was not realised during the hearing, and therefore it was not put to the relevant witnesses when they gave evidence. That is in relation to ADSCOM's overall responsibility in monitoring airport operational readiness ("AOR"), dealt with in the concluding part of Chapter 5. Although the allegation was not put to relevant witnesses for them to answer, the Commissioners think that as their opinion and finding are based on their understanding of the circumstances surrounding the issue and the law, rather than dependent on any answers that might have been given by the witnesses, it is proper to include their views in the report.

Section 4 : Criteria

3.27 Some of the matters the Commissioners are tasked to examine are the adequacy of communication and coordination of persons responsible for the opening of the airport, and the readiness of the airport for being opened on 6 July 1998. Readiness involves whether the new airport was safe, secure and efficient for users, including aeroplanes, passengers, and those working in it. In performing their functions, the Commissioners will have to determine the criteria against which the involved persons should be judged in relation to the various issues within their remit, in particular "readiness", "efficiency" and "adequacy" in their respective context.

3.28 In the Commissioners' opinion, readiness, efficiency and adequacy are all matters of degree and they have to be examined in the surrounding circumstances. The Commissioners are Hong Kong people, and the Hong Kong perspective will be taken into account. However, for judging these issues in relation to the operation of the new airport, which is an international airport, the Commissioners decided that it is proper also to take into consideration the international viewpoint and experience. That was the reason why the four experts with different backgrounds were appointed. While Professor Shen obtained his first degree in Taiwan, Professor Cao got his in China, and both of them were conferred a doctorate by a US university. Mr Jason Yuen is an airport expert based at the San Francisco Airport, although he has experience with airports outside the USA. On the other hand, Dr Kipper operates from his airport management company at Frankfurt Airport and has worked in airports in Europe and South East Asia. The expertise from all of them would enable the Commission to view the subject matter of the inquiry in an international perspective.

3.29 A few examples on readiness may help to explain why the Commission considers that the issue has to be examined in all the surrounding circumstances. If a person were to say that he is ready to leave home for going to the market to buy things, he would only be ready when he has brought with him some money for the purpose. If he were to go out to a dinner party, he would only be ready when he is properly dressed for the occasion. If he were to go to catch a plane, he would not be ready unless he brings with him his travelling documents. In the context of AOR, especially the huge airport at Chek Lap Kok ("CLK"), the steps to be taken for readiness must be magnified, to say the least, thousands of times. An example which is very much smaller by scale is organising a picnic for a school with 1,000 students. Each of the students will have to be notified of the programme, where to meet and what to bring and the food arrangements, etc. The teachers who are responsible will have to decide what happens if one or more students are late or sick to attend the meeting place, or what to do if they feel sick in the middle of the trip, etc. The organisation and works of the airport are many more times larger, and there are at least the systems integration issues that are not normally required to be handled in a school situation. In a school organisation, there has been an established class system, say each consisting of 40 students, headed by a class teacher. Each class teacher is under a head teacher or supervisor responsible for a number of classes or forms, and the supervisors are under the direction of the headmaster. The small degree of integration, if need be, is to be made through the line of control, by the class teacher over the class, then by the supervisors over the class teachers, and by the headmaster having charge of all the supervisors, teachers and students. This system of control and integration is simple and can be appreciated by most people who have gone through school.

3.30 However, building an airport and making it ready for operation is a very different matter. There were at one time over 20,000 labourers of various disciplines involved in the building of the airport, employed by over 80 main contractors. Contractors were employed by AA and its 28 business partners and franchisees, and many contractors shared their work with many sub-contractors and sub-subcontractors. Building works themselves require very careful and close coordination. It may be easier for the general public to appreciate the situation by using an example when a person wishes to decorate or refurbish a flat involving, say simply four types of work: painting the walls and ceilings for the whole flat, building some shelves, laying carpets and changing the floor tiles of a bathroom. Instead of entrusting all the four types of works to a single contractor, the flat owner asks four different contractors to do each type of the works required, for the sake of saving some expenses.

Which of the four kinds of works should be done first, and which last? It seems that the changing of the bathroom floor tiles has nothing to do with the other three and so it can be done first. But if the bathroom walls have to be painted, should the floor tiles be laid first or the walls be painted first? Should the shelves be put up first and then the walls painted, or vice versa, or should the carpets be laid after everything else is done? Or rather, should each piece of the works be done partially to await other pieces of the works to be done partially, and various stages of the works would have to be programmed very carefully in order to avoid delay and workers of different contractors crossing each other's paths and doubling the tasks. The existence of four different contractors will certainly complicate matters and the flat owner will have to do all the necessary coordination all by himself. That is why that sometimes in order to save the trouble, the flat owner will entrust all the works to one contractor and let the latter do all the coordination. But that will in most cases involve greater expenditure, for the contractor will certainly include in his charges a sum for covering the time and effort he has to spend in coordinating the various pieces of works.

3.31 Doubtless, there are many officers and staff of AA who are experienced people in various well-established professions, such as engineering, building, IT and management. As funding was provided piecemeal at the initial stages of the construction of the new airport, AA did not contract out all the works required to achieve AOR to one single contractor. In fact, over 80 contractors were employed to construct various buildings, to provide various building services and facilities and to supply and commission various technological, IT and computer systems. AA has had to perform the coordination of all these various works and systems. Moreover, various buildings and facilities were to be provided by business partners and franchisees, such as catering, provision of aeroplane fuels, baggage and cargo handling, to name but a few. While these business partners and franchisees were bound by contract to complete their works and therefore make their buildings, services and facilities ready for airport users, if they slip one way or another, AOR will be affected though AA may charge them penalties according to the contractual terms or may claim damages for breach of contract against them in the courts. AA oversaw their works so as to ensure completion in time, but AA could hardly do anything else except to impress upon them and the sub-contractors employed by them the importance of completing promptly. There could not be direct interference, and even if there could be, in the short time available since January 1998, nothing could possibly be done to improve even if AA were to take over their works.

3.32 All that said, the Commissioners do not forget that AA had teams of highly professional officers and staff. They are trained and experienced in the works and non-works activities and in coordinating them. It is on that plane that their performance is to be judged. Another context in which the whole matter must be viewed is that they were not only putting up a house or a building, but they were building a huge airport involving air traffic and thousands of users each day. Readiness in this sense must necessarily mean that the buildings, services and facilities are not only available, but that they have to be safe, secure and efficient in performing all their proper and expected functions.

3.33 On the other hand, the involved parties did not envisage that on AOD, the new airport would be fully ready as if it were that everything that was available in Kai Tak would be there in CLK, because for instance, phase 5 of the relocation exercise, to take place between 06:30 hours on 6 July to 5 August 1998 had still to be performed. The readiness required to be judged must be viewed in this light.

3.34 People in Hong Kong are always proud of their efficiency. The social welfare status of Hong Kong has been such that except for the very needy who may be taken care of by the Government, every one looks after his own welfare. It is a densely populated community where survival and flourishing depends on the personal endeavours made by the individual, in constant competition with others. When one can afford it, there are numerous and multifarious entertainment avenues available. It is a vibrant and hectic place where the flame of life burns vehemently. Remarkable efficiency amongst the people has developed throughout the years because of keen competition and a feeling of allowing nothing to be missed, either in work or enjoyment, within a given time span. For example, people do not have to wait for long inside a bank to transact deposit or withdrawal transactions. Bank tellers, while courteous, will not spend time to chit-chat with customers, so that the next customers in line will not need to wait any longer than necessary. Throughout the territory which is less than 400 square miles in area, there are thousands of automatic teller machines provided by various banks for people to withdraw money, 24 hours a day. Apart from fast food stalls, small restaurants can be found in many places where one can have a meal served within a couple of minutes, etc. This efficiency applies to all sorts of things and activities, while improvements are constantly attempted and people's expectation of efficiency keeps on growing.

3.35 Nevertheless, the Commissioners, as Hong Kongers themselves, feel that efficiency and expectation of it must be put in their proper perspective. Efficiency is in most cases relative, and expectations are generally based on former experience. If an outgoing passenger gets into the airport and is immediately served by the check-in counter, the immigration counter, the customs check, then these services can be considered to be absolutely efficient. But if he is the second person in a queue to be dealt with by the airline staff, the immigration and customs officers, then he may feel that the services are not efficient. The worse if he ranks tenth or later in such a queue. It is difficult to set a proper standard for efficiency, especially a situation may change with numerous permutations depending on the length of the lead time before the estimated time of departure of the flight that the passenger is catching and the time when he arrives at the airport as well as other events such as when other passengers boarding the same flight arrive and many other circumstances which do not necessarily depend on the number of staff deployed at each of the counters that he has to go through before boarding the plane. It is therefore necessary to compare with the situations at Kai Tak and in airports throughout the world or at least in developed countries in order to gauge efficiency.

3.36 In this respect, the survey on user friendliness of the new airport carried out by the Tourist Association in a period of five days on 10 to 14 July 1998 is instructive. It is pointed out, as evidenced by the responses to the questionnaire used by the Association, that overseas visitors were more easily satisfied than local residents, regarding almost every aspect of the airport services and facilities.

3.37 Adequacy is another issue that has to be judged in all the surrounding circumstances and in the context to which it relates. In Hong Kong, a flat of about 100 square metres is said to be a middle range residence, whereas in many parts of the USA, a place of that size is considered to be very small. When translated in terms of adequacy, a residence of such a size will sometimes be considered to be adequate for a family of four, but sometimes inadequate. In the context of communication and coordination in the planning and preparation for the opening of the new airport, adequacy therefore has to be gauged against many factors such as how much the airport was ready for operation, whether the services and facilities rendered were safe, secure and efficient, the importance of the task to be performed, the qualifications and experience of the persons involved, the positions of such persons, etc. All these will have to be viewed against the Hong Kong standard and in the international perspective.

3.38 Having considered all evidence and matters, the Commissioners are firmly of the opinion that the minor problems encountered on AOD and shortly thereafter should not fairly be used as the basis for treating that the new airport was not ready for operation, that minor human errors should be excusable even according to the high standard of efficiency of Hong Kong people and their expectation and that slight oversight with insignificant consequence should not be considered as the matter not having been adequately attended to or considered.

3.39 The Commissioners have also borne in mind and at heart the danger of using hindsight as the basis of criticism. Pollock MR said in *City Equitable Fire Insurance Co Ltd* [1925] 1 Ch 407, CA, at 509:

> "As I have already said it is quite easy to charge a person after the event and say: 'How stupid you were not to have discovered something which, if you had discovered it, would have saved us and many others from many sorrows'."

3.40 Hindsight is important for discovering what lessons to be learned from a past event, and perhaps even more important for the purpose of the inquiry in finding out the truth, but it is not a proper yardstick against which blame should be evaluated. This approach is also shared by W51 Mr Jason G YUEN when in cross-examination he agreed to the following proposition: "Hindsight is necessary for ascertaining what is the cause of things, but hindsight is not a good measure for responsibility and blame." In the process of reaching their findings and conclusions, the Commissioners have judged the responsibility of each of the persons subject to inquiry by what he knew or should reasonably have known at the time of his conduct or activity and in the light of all the surrounding circumstances.

Section 5 : Standard of Proof and Treatment of Evidence

3.41 Under the terms of reference, while the Commission is tasked to inquire into the decision on AOD, problems affecting the operation of the new airport and the causes for such problems, it has to make findings and draw conclusions as to where the responsibility lies. On the other hand, it is expressly proscribed from deciding on civil liabilities amongst involved parties. In civil cases, normally the onus of proof lies on the party who makes the assertion, and the standard of proof is on the balance of probabilities, meaning more likely than not. The Commission is of the view that for matters to be decided by the Commission, although there is generally no onus of proof on any party, it is always safe and proper to adopt the same civil evidence rule that he who alleges must prove. The standard of proof adopted by the Commission is also generally on the balance of probabilities, but the more serious the nature of the allegation or criticism, the weightier the evidence there must be for the Commissioners to be satisfied. A finding on an issue must be supported by a standard of proof commensurate with the seriousness of the issue. Where it is stated in this report that the Commission reaches any finding or conclusion, the standard in support is that on the balance of probabilities. When the finding or view is based on more cogent evidence, the Commission will state the higher standard that has been reached, by using terms such as "beyond all reasonable doubt", "sure", "undoubtedly", "doubtless" or "absolutely", etc.

3.42 In the course of the inquiry, voluminous documents have been supplied by parties and non-parties to the Commission. Witness statements of over 200 witnesses have also been obtained. The length of hearing by the Commission was kept to the minimum, so as to save time and enable the Commission to reach its conclusions within the time allowed by the terms of reference and to prevent expending any amount of public funds more than absolutely necessary. Only 56 witnesses were called and examined on oath or affirmation at the hearing, and some of them were called as a group so as to optimise effect and minimise time. Greater detail of this unusual procedure can be found under Section 3 of Chapter 4. The witness statements of the witnesses who were not called are considered although the persons had not been subject to oral examination by the Commission or the parties. Over 1,200 inquiry letters were sent from time to time to parties and non-parties to seek as much information on various issues as possible to avoid having to call persons or organisations who dispute the issues, a measure also to keep the length of the hearing to the minimum. The witness statements, the answers to the Commission's inquiry letters and a large amount of the documents have been examined and many of the Commission's findings are based on them. The Commissioners have been conscious of the fact that sometimes it would not be very satisfactory to rely on documents and witness statements when there was no opportunity for the person or organisation affected by them to cross-examine the makers to test their evidence. However, the Commissioners feel that in the circumstances and for public interest, that has to be done, or else the inquiry could only be concluded within years, and their findings would only be made when the public's memory and interest in the subject would have long evaporated. The Commissioners have exercised great care when documentary evidence is preferred to witnesses' oral testimony. Moreover, oral testimony based on a witness's memory of events may not be of better evidential value than contemporaneous documents. The Commissioners also observed witnesses' demeanours in evaluating their evidence and sometimes rely on the inherent probabilities of matters to help determine where the truth lies and whether a witness is truthful.

CHAPTER 4

THE HEARING AND CONFIDENTIALITY OF DOCUMENTS

Section 1 : The Hearing

4.1 As alluded to in Chapter 2, the hearing conducted by the Commission began on 14 August 1998, to deal with preliminary procedural matters before the substantive hearing of testimony. The preliminary hearings were to ensure that the substantive hearing was to be conducted smoothly and with as little interruption as possible. Altogether there were three sittings on preliminary matters and 58 days of substantive hearings. The hearing dates and witnesses appearing at each are set out in **Appendix IV** to this report.

4.2 All the hearings were conducted in public, like any court hearing of civil or criminal litigation. Everything done by the Commission was transparent, and the evidence that the Commission would or might rely on in the consideration of its findings and conclusions were all mentioned at the public hearings. Those who might be implicated or concerned in the subject matter of the inquiry were at their request duly made parties to the proceedings. Almost all of them were represented by counsel or solicitors, whose proper questioning of witnesses was invariably allowed. They were all informed of the experts appointed by the Commission, their respective expertise and the issues to be dealt with by them. The parties were free to appoint their own experts and have the difference in expert opinions resolved either by agreement between various camps including the Commission or by orally examining the expert evidence at the hearing. Timetables of witnesses' attendance, which were revised from time to time as circumstances demanded, were supplied to the parties to the proceedings as well as members of the media who had expressed an interest of getting them.

4.3 Due to time constraint and the voluminous documents involved, no hearing bundles of documents could be prepared for the use of the parties to the inquiry. However, to enable the parties to prepare for the witnesses to be called, counsel for the Commission were directed to provide to the parties with an index of files or documents with page reference to be referred to in respect of a particular witness within three days before he/she was to give evidence or within two days after his/her witness statement was submitted, whichever was later. Parties who wished to refer to further documents relating to the witness were required to give notice of the additional documents with relevant page reference within 48 hours of receipt of the index. Such parties were also required to prepare 27 copies of the files or documents covered by their notices for the Commission and the parties on the day when the witness was called.

4.4 All the above was done for ensuring fairness to the parties, especially to the persons who might be implicated by the Commission's findings and conclusions. Members of the public had full liberty to attend any of the hearings as they pleased. The presence of many members of the media at the hearings enabled the proceedings to be reported and made known to the public who did not attend. The Commissioners are confident that justice has been done and has been seen to be done.

Section 2 : Confidentiality of Documents

4.5 The only thing that was not disclosed to the public or the media is the contents of the documents on which a successful claim for confidentiality was made by the parties. During the preliminary hearing to hear interested persons as to their participation in the substantive hearing of evidence, their legal representation, and various other procedural matters, the question of confidentiality of documents was raised. The parties had supplied or would supply numerous documents to the Commission. They expressed their willingness and readiness in providing documents to the Commission to assist in its inquiry but were concerned that the disclosure of some of these documents to the public or other parties would be detrimental to their interest. While the Commission had power to order production of documents, and the parties were cooperative in that respect, the Commission was mindful that any person supplying the documents should not have his interest, commercial or otherwise, unnecessarily affected. A balance must be properly drawn in order to enable the public to know the evidence adduced to the Commission and the interests of the parties that ought in all fairness to be protected.

4.6 At the preliminary hearing on 21 August 1998, the Commission made rulings on the documents that were irrelevant and those that would be regarded as confidential, in the sense that they should not be released to the public or other persons during the public hearing of evidence, and if such documents had to be referred to in the hearing, protection would be provided to ensure the least impact on the party supplying the documents. The Commission's rulings and directions are summarised below, with brief reasons:

(1) Regarding materials that are irrelevant, they should not be used for the inquiry at all, and no party to the inquiry except the one who has supplied them to the Commission should have access to them. The Commission's Secretariat will check the documents claimed by all parties to be irrelevant and exclude them from being accessible to anyone other than the supplier. Any disagreement between the party making the claim and the Commission's counsel on irrelevance will be determined by the Commission at a later hearing.

(2) Regarding the relevant materials, the following grounds in support of the claims of confidentiality of documents supplied to the Commission are allowed:
    (a) Security – materials relating to the security of the new airport and related operational procedures. These materials should generally be excluded on the ground of

public interest for the protection of the security and safety of the airport and its users.

(b) Intellectual Property Rights – materials showing the design and specifications of devices and systems that are subject to intellectual property rights. These materials should generally be excluded on the ground of trade secrets and for the protection of intellectual property rights and technical know-how.

(c) Commercial Sensitivity – materials concerning pricing and costing. These materials should generally be excluded on the ground of trade secrets for protecting the marketing techniques and competitiveness of business concerns.

(d) Potential Litigation and Claim – materials that are subjects of potential litigation and claim, including materials that are subjects of legal professional privilege and discussions on how claims or potential claims are to be dealt with. The materials subject to professional privilege should be excluded absolutely (whether they are relevant or irrelevant to the inquiry) on the well-established basis of safeguarding confidence, trust and candidness between client and lawyer in the context of fair administration of justice. The discussions on how claims or potential claims are to be dealt with should be generally excluded on the ground that they are secrets which the others concerned with such claims should not be given any opportunity to get to know, or otherwise the party involved in the discussions would be unfairly prejudiced.

(3) Regarding the materials that are subject to the general exclusion under the four allowed grounds, however, there may be certain materials that are germane to various issues of the inquiry. These materials may be used at the hearing. The Commission can exclude the public and parties who are not concerned with the particular topic from the hearing, and that part of the transcript relating to such closed door hearing can be excised before the transcript is made available to

parties other than those participating in the closed door hearing.

(4) The following directions arise from and are ancillary to the above rulings:
   (a) The materials, either in the form of a document in its entirety or in the form of identified parts of a document, should first be excluded or blocked out from the Copying Bundles kept by the Commission's Secretariat. They will therefore not be disclosed to the other parties allowed to have access to the Copying Bundles. The non-disclosure will be maintained regarding the documents that may be compiled for the use of the hearing.
   (b) The parties claiming the exclusion must identify, by reference to the page numbering used by the Commission, all the documents in their entirety or the specific parts of each of the documents sought to be excluded pursuant to the four allowed grounds, and notify the Commission's Secretariat accordingly. They shall use their best endeavours thereafter to render assistance to the Secretariat in effecting the exclusions and shall be prepared to attend the Secretariat for that purpose. The Secretariat will make arrangements with them for their attendance. Parties who do not submit their identification expeditiously will be deemed to have waived their claim of confidentiality on the documents and materials supplied by them to the Commission.
   (c) Immediately before the generally excluded materials are to be referred to at the hearing, the party wishing to rely on the Commission's general ruling on exclusion should be on the alert to make an application to the Commission for exclusion of the public and unconcerned parties from the hearing and the consequent excision of the transcript. This kind of application will be dealt with on an ad hoc basis.

(5) To further protect the parties who have supplied documents

and materials to the Commission for the purpose of the inquiry, each party to these proceedings and their legal representatives must each give a written undertaking to the Commission that no document, material or information obtained from the Commission or the inquiry, save the Commission's report to the Chief Executive or any part thereof which has been made public, shall be used for any purpose other than for the inquiry. The form of the undertaking will be settled by the Commission.

4.7 Based on the above rulings and directions, many parties who had supplied documents to the Commission started their claim of confidentiality and irrelevance. The documents provided to the Commission were voluminous and when sorted by the Commission Secretariat, they comprised not less than 800 box files each consisting of about 500 pages. Messrs Baker and McKenzie, solicitors for the Commission who worked under the direction of the Commission's team of counsel, had to deal with all the claims in a preliminary manner, going through the claims made by the parties, agreeing to them and overseeing the parties in taking steps to expunge the documents or to obliterate parts of the documents from the files before they were allowed to be copied by other parties. There were some initial disagreements of confidentiality, which were fortunately resolved in the spirit of goodwill and cooperation between all concerned. The Commissioners' task in determining on particular documents or portions of them within the ambit of their rulings was greatly relieved. As a result of this onerous exercise, about 500 files remained to form the centre of the attention of the parties and the Commission and its team of lawyers.

Section 3 : Hearing of Witnesses by Group

4.8 The inquiry hearing followed the same procedure as a court trial where witnesses are called one by one. Each witness gives evidence in chief, led by the party calling him. He will then be cross-examined by the other party or parties, and thereafter re-examined by the calling party. About a week after the commencement of the hearing of evidence, the Commissioners were concerned about the slow speed at which the hearing was proceeding and the fact that quite a number of answers given by witnesses were based merely on their understanding of the situation from information supplied to them by other person or persons. The witnesses alleged that because of their position in the organisation in which they worked, they were not responsible for the area with which an issue was related, and someone else in his organisation had the responsibility for that area. That meant, either they said they could not answer the questions, or when they answered the questions, their answers were based on second-hand knowledge. The consequence was that the person or persons who were alleged to have direct knowledge would have to be called. The Commissioners found this unsatisfactory because not only that issues raised could not be resolved immediately, but also that calling other witnesses on the same issues would inevitably prolong the proceedings. Moreover, the former witnesses might have been allowed to shirk the responsibility to answer a question. Although they might be recalled, that would result in time being wasted.

4.9 At a meeting to discuss the progress of the hearing, the Commissioners learned that their concern was shared by counsel and solicitors for the Commission. Everyone was trying to see a way to alleviate the situation, and Dr Edgar Cheng raised a novel and interesting suggestion. He proposed that witnesses from an organisation should be called as a group so that all those who were or might be responsible for areas relating to particular issues of the inquiry would all be brought before the hearing to answer questions put at the same time. While the proposal was attractive as being able to solve the problem facing the Commission, all the lawyers at the meeting were feeling uneasy about it as being anomalous to their training and conventional practice. In an ordinary court case, the normal practice is for witnesses to be called one after another, each individually giving evidence in chief, cross-examined and re-examined. There has not been a case in Hong Kong known to those present at the meeting where a group of witnesses gave evidence together in the witness box. After considering the proposal for a day and seeing that there was nothing against the principles of fairness and justice, the Chairman agreed to put the proposal to the parties at the hearing.

4.10 All counsel for the parties who addressed the Commission on the proposal were unanimously against the idea. Having considered counsel's submissions very carefully, the Commission was of the view that the proposal should be put into practice, and gave the following ruling on 21 September 1998:

> "For the purpose of saving time and concentrating on particular issues, and to help establish the identity of the person who has personal knowledge of matters relating to those issues, at the hearing last Friday, the Commission proposed that a group of witnesses from a party should be called to give evidence en masse. We heard counsel's views on our proposal and all those for the parties who spoke were against it. Their views can be summarised as follows:
>
> (a) the proposed course is probably unworkable because if a group of witnesses are asked a question, none of them would know who is going to answer what;
> (b) if one of the group is criticised, it would be unfair to him because the questions put were answered by someone else in the group and not necessarily himself;
> (c) there will be a risk of treating the evidence from the group as the evidence of the individual, especially if that individual is to be criticised;
> (d) a witness in the group may not only be relevant to the issues examined, and he will have to be recalled individually when other issues relevant to him are examined;
> (e) it may be difficult or unmanageable if all the witnesses in the group are to give evidence in chief simultaneously, or cross-examined simultaneously;
> (f) it may make counsel's tasks in preparation of the examination more difficult; and
> (g) it may create practical difficulty because if the witnesses to be in the group are important for the running of the business of the party, and the requirement of all of them to attend the hearing together will debilitate the party's operation.
>
> We have considered the matter very carefully, especially in view of the objection by counsel, almost in unison. However, in view of the fact that we have all to work towards a time target, ie, to

complete the hearing by sometime in December, and in order to enable better focus on certain issues in the inquiry, we feel that it may be profitable to make an attempt to have several witnesses called together on a particular issue or issues. This direction of course will not apply to general matters or evidence required of a witness who will cover a number of matters that may or may not be related to a single issue.

Our direction will no doubt enable the parties concerned to concentrate on a particular issue, by having all the witnesses (from a party) who are or may be responsible for that issue to be called together. Anyhow in preparation of the examination of each of the witnesses in a group, counsel would certainly have to take into account the contents of the witness statements of the others in the group. It will be beneficial to clarify amongst all the witnesses concerned with the issue from a party to be asked a global question who in fact was responsible for what, and then the questions can be directed at the person who claims or admits to be so responsible. We do not think that counsel's task will be rendered harder. But even if there is some risk of it being so, we think that the benefit of having all matters relating to one issue and the responsibility for it clarified at the same time with all those who have personal knowledge or may be responsible would outweigh the little disadvantage that might be encountered by counsel.

We propose the following guidelines for the examination of a group of witnesses so that most, if not all, of the problems postulated by counsel would unlikely occur:

(a) Where a number of witnesses are called at the same time, each of them will be sworn or affirmed individually.

(b) For the LiveNote record, each will be assigned an alphabet, from B onwards, because A is normally reserved for meaning "answer".

(c) All the witnesses will have made a witness statement or statements, and their witness statements are to be treated as evidence in chief under oath.

(d) The party who leads the evidence of a group of witnesses will be allowed to ask a few questions of each of the witnesses individually, to clarify or add to what is stated in his own witness statement(s).

(e) The cross-examination of the witnesses will, depending on circumstances, be either directed at the group or at each individual witness. For example, 'Who is responsible for testing a particular area of a system?' will be a global question to all, whereas the witness whose responsibility is thus identified can be asked questions directed to him alone. At the end of each question or at the close of the party's cross-examination, a wrap-up question may be asked of the group if any member would like to say anything further on what the other or others have said. When a global question is asked, the witness who wishes to answer will be asked to raise his hand.

(f) Re-examination can also be done either by asking a question of all of the witnesses or directed at one particular witness.

Our guidelines seem to be able to answer the first six of the points made by counsel. Hereunder, we examine each of the points made, following the same sub-paragraph numbering under the first paragraph of this ruling:

(a) The argument that none of the witnesses in a group would know who is going to answer what will not arise as the decision on who is to answer what rests with the counsel asking the question.

(b) If one of a group of witnesses is to be criticised, the criticism should be directed by counsel to him, and he will not take responsibility for an answer not given by him.

(c) Any criticism that may be made by counsel or the Commission of an individual witness will be based on all the evidence received; and any counsel who wishes to put an allegation or accusation against the witness personally will give him an opportunity to answer.

(d) A witness who is in a group of witnesses and whose evidence is required for other issues apart from the issues examined during his participation in the group will have to be recalled individually; but this will not increase his burden, as anyhow he will need to be examined on both sets of issues.

(e) The group of witnesses will be in the witness box together, but our guidelines do not have the consequence of their giving evidence simultaneously.

(f) As we said earlier, counsel's tasks in preparation of the examination may or may not be more difficult, but the benefit of enabling everyone, counsel and witnesses alike, to focus on a particular issue should outweigh any small disadvantage that may be experienced.

(g) Regarding the practical difficulty that might be caused to the operation of the business of the party, we feel that if the witnesses, whether individually or in a group, will be required to attend the hearing, their absence from work, either staggered or globally, will have similar effect to the party. However, we will keep an open mind on this, and when the timetable, which will list the witnesses to be called in a group by enclosing their names in a pair of parenthesis with an indication of the issue or issues to be dealt with, the party concerned who sees the difficulty can address us, although of course, we do not wish to spend too much time on this sort of application."

4.11 Pursuant to the ruling, several groups of witnesses from the following parties were called dealing with the same or related issues: the Airport Authority, Hong Kong Air Cargo Terminals Limited ("HACTL"), Murata Machinery (HK) Ltd, New Airport Projects Co-ordination Office, Cathay Pacific Airways Limited, the two experts appointed by HACTL and two of the information technology experts appointed by the Commission. The witnesses who gave evidence as a group can be identified in the Hearing Dates and Witnesses at **Appendix IV** by the word "(with)" appearing after the name of those who gave evidence with one or more witnesses. Nothing unfair or unjust or untoward happened, and no counsel for any party criticised the procedure or addressed the Commission further on it. The procedure operated smoothly and effectively. In the Commissioners' view, the procedure worked satisfactorily and contributed to saving time, effort and costs of all concerned.

CHAPTER 5

THE ROLES AND DUTIES OF KEY PARTIES AND COORDINATION

Section 1 : Introduction

5.1 Under the September 1991 Memorandum of Understanding Concerning the Construction of the New Airport in Hong Kong and Related Questions ("Memorandum of Understanding") signed by the Governments of the People's Republic of China and the United Kingdom, a new airport was proposed and to be completed to the "maximum extent possible" by 30 June 1997.

5.2 The new airport was a portion of the Airport Core Programme ("ACP") including altogether 10 major infrastructure construction projects with the new airport at Chek Lap Kok ("CLK") being the ultimate focus of attention.

5.3 In January 1994, a 45-month programme was established by the then Provisional Airport Authority ("PAA") and endorsed by the Airport Development Steering Committee ("ADSCOM"), based on step-by-step funding considerations and forecast award dates for the foundations of the Passenger Terminal Building ("PTB"), superstructure and other major contracts. This would lead to an airport opening target of 30 September 1997.

5.4 After the Support Agreement Relating to the Financing, Construction and Operation of the Airport was signed on 1 December 1995, it was announced that the new airport would be opened in April 1998, followed by the opening of the Airport Railway ("AR"), which was later known as Airport Express, in June 1998. Since then, April 1998 had been adopted as the target date for opening the new airport for the purposes of planning, programming and preparation.

5.5 On 1 December 1995, the Airport Authority Ordinance ("the Ordinance"), Chapter 483 of the Laws of Hong Kong, came into force, whereby PAA was reconstituted to become the Airport Authority ("AA"). The aim of the Ordinance is, inter alia, to enable AA "to provide, operate, develop and maintain an airport for civil aviation in the vicinity of" CLK and makes provision for "the safe, secure and efficient operation of such airport and for connected purposes."

5.6 While no specific day in April 1998 was mentioned, AA targeted 1 April 1998 in their programmes, milestone lists and reports.

5.7 Towards the end of 1997, AA revised the target to the latter part of the month, ie, on or about 29 April 1998.

5.8 On 13 January 1998, the Government announced that the new airport was going to open for operation on Monday 6 July 1998. The decision to open the new airport on airport opening day ("AOD") was made by ADSCOM with the approval of the Chief Executive in Council.

Section 2 : The Roles and Duties of the Key Parties

5.9 In order to understand how the decision to open the new airport was made and the duties of each of the parties regarding the problems that occurred on AOD, it is necessary to consider and understand the roles played by each of the parties. The duties of most of the parties are mainly based on contract and their roles are apparent from the contractual relationship. There are only a few exceptions, which are AA, ADSCOM and the New Airport Projects Co-ordination Office ("NAPCO"), who were the key parties in the setting up of the new airport. The roles and duties of these key parties and their relationship amongst each other are examined here.

(a) <u>AA</u>

5.10 PAA was established on 4 April 1990 for putting through the airport project, while other organisations were to be responsible for various parts of the ACP. PAA was succeeded by AA in December 1995, by virtue of the Ordinance.

5.11 AA's creation was heralded in the Memorandum of Understanding of September 1991, which provides that an "Airport Authority" should be established by legislation "to be modelled as far as possible on the Mass Transit Railway Corporation Ordinance." Under the Ordinance, AA is a statutory corporation. It has the status like a private company developing and running the new airport. The rationale behind, which can be found in the Consultation Paper published by Government in January 1994 together with the Airport Corporation Bill, is to enable AA to act in a more commercial manner than would be possible for a Government department, with two benefits, namely,

(a) AA would be able to work more quickly and be better placed to fast-track development to meet urgent development timetables; and

(b) the level of direct funding support required from the taxpayer that would otherwise be required if the airport was to be run by Government or any of its departments would be reduced, because AA as a commercial concern would be able to borrow substantial amounts successfully without requiring full Government guarantees of its debt, thus reducing the direct equity funding required from

Government and reducing or eliminating the liabilities involved for Government in guaranteeing debts.

5.12 When W36 Mrs Anson CHAN, the Chief Secretary for Administration and Chairman of ADSCOM ("the Chief Secretary"), gave evidence in the inquiry, she told the Commission the background of the decision to establish a statutory corporation to build and run the new airport. At the material time, Government considered very carefully several options as to the best way of providing for the planning, construction and operation of the airport and commissioned consultants to advise on the institutional arrangements. In the light of the consultants' recommendations, having examined various options, and taking account of the efficient and effective way that the Mass Transit Railway Corporation, an independent statutory corporation, had operated the Mass Transit Railway for some time, Government decided that the best way was to go for an independent statutory corporation that would have statutory responsibility for the planning, construction and operation of the airport. A corporation that would be required to operate on sound commercial principles, free of Government bureaucratic interference and the need to adhere to Government regulations, would be in the best position to deliver an airport within a shorter timeframe than a Government department, in a more cost-effective manner, and would be able to raise funds in the open commercial market, and thus keeping public expenditure down to a minimum. The aim was not only to minimise public expenditure, but more for providing Hong Kong with an efficient, safe and secure airport that the community could be proud of.

5.13 In order to fully understand AA's role and responsibilities, reference should first be made to the relevant provisions of the Ordinance. Section 5(1) of the Ordinance stipulates the purposes of AA, as follows:

> "maintaining Hong Kong's status as a centre of international and regional aviation, provide, operate …, develop and maintain, at and in the vicinity of Chek Lap Kok, an airport for civil aviation".

Under the same subsection, AA may provide at or in relation to the airport such facilities, amenities or services as are, in its opinion, requisite or expedient.

5.14 Section 6 of the Ordinance is also important. Section 6(1) provides that AA "shall conduct its business according to prudent commercial principles and shall, as far as practicable, ensure that, taking one year with another, its revenue is at least sufficient to meet its expenditure." Section 6(2) further provides that AA "shall, in conducting its business or in otherwise performing its *functions*, have regard to safety, security, economy and operational efficiency and the safe and efficient movement of aircraft, air passengers and air cargo." The only limitations and restrictions of AA's powers are provided for in various sections of the Ordinance:

(a) AA is not to establish or operate meteorological service or air traffic control service, or make any air service agreement or air service arrangement with the government of any country or territory outside Hong Kong, etc [s 8];

(b) The Chief Executive in Council may make regulations for various purposes, the most important of which is for securing the safe or secure operation, or the proper maintenance, of the airport or for securing the safety of persons or a specified class or description of persons who are within the airport area [s 18];

(c) The Chief Executive in Council may, if he considers the public interest so requires, give to AA such directions (in writing) as regards the performance of any of its functions as he considers appropriate [s 20];

(d) DCA may, in consultation with AA, give a direction to AA in order to discharge or facilitate the discharge of an international obligation regarding civil aviation, etc [s 21];

(e) The Chief Secretary may require AA to execute works or measures to ensure a risk of injury to persons within the airport area due to the defective condition of the airport or any vehicle, vessel, machinery or other plant or equipment in any place in the airport area to be eliminated or significantly reduced [s 39]; and

(f) The Chief Executive in Council may make regulations providing for the appointment by the Chief Executive of persons to be inspectors for enforcement the regulations under s 18 or s 39 [s 38].

5.15 AA's affairs shall be under the care and management of a board whose functions shall comprise such care and management [s 4] but the board is at liberty, subject to certain exceptions, to delegate any of its functions to any member or employee, including the Chief Executive Officer [s 9].

5.16 According to the above statutory provisions, AA is a statutory corporation having the purpose of providing, developing, operating and maintaining a new airport with the objective of maintaining Hong Kong's status as a centre of international and regional civil aviation. It must carry out the purpose and objective in accordance with prudent commercial principles but in conducting its business or performing its functions, it must have regard to safety, security, economy and operational efficiency and the safe and efficient movement of aircraft, air passengers and air cargo. Save for the limitations and restrictions of its powers by possible Government intervention, under the provisions of the Ordinance set out in paragraph 5.14 above, the AA Board enjoys full autonomy and can delegate all its functions to its employees and the Chief Executive Officer ("CEO"), who was for all purposes of this report W3 Dr Henry Duane Townsend. It is in this context that the relationship between the key parties relating to the opening and operation of the new airport should be examined.

5.17 Apart from AA, there is the Airport Consultative Committee which is mainly responsible for gathering public opinion on matters relating to the new airport and passing it onto Government. The Commissioners have not found any of the subject matters of the inquiry relates to the Airport Consultative Committee, and therefore its role and participation are excluded for further consideration in this report.

5.18 According to the above-mentioned declared policy of Government and the statutory provisions, AA would and should be run as a commercial concern, with minimal bureaucratic interference or intervention of the Government. Indeed, apart from matters that relate to public expenditure and that may affect the public interest, in which Government intervention may be possible by way of calling in an audit by the Director of Audit or appointing an inspector to investigate AA's affairs, the Ordinance confers full autonomy and independence on AA.

5.19 AA is structured with a Board and a management. The Board, chaired by W50 Mr WONG Po Yan, has 15 members, consisting of six ex-officio members and nine non-official members. The ex-officio members are the Secretary for Economic Services, the Secretary for the Treasury, the Secretary for Works, the Director of Civil Aviation, the Chief Executive of the Hong Kong Monetary Authority and the Director of NAPCO. The names of the 15 members in 1998 are set out in **Appendix V**, and W3 Townsend, the Chief Executive Officer of AA is among them. The AA management was headed by W3 Townsend, and under him there were over 1,800 staff, notably for the purposes of the inquiry W43 Mr Douglas Edwin Oakervee (Director of Project Division ("PD")), W44 Mr Chern Heed (Director of Airport Management Division ("AMD")) and W45 Mr Kironmoy Chatterjee (Head of Information Technology Department). It is to be noted that W43 Oakervee was an experienced engineer, W44 Heed is a seasoned airport manager and W45 Chatterjee is a well-established IT professional, and each of them is assisted and was at all material times assisted by a number of experienced professionals in the same field.

5.20 While AA's counsel accepted that AA had to closely scrutinise the development of Flight Information Display System ("FIDS") and other systems and works in PTB which were to be provided, installed and built by its own contractors and subcontractors, they submitted at length that AA did not have any statutory duty but only administrative function to monitor the activities of franchisees such as Hong Kong Air Cargo Terminals Limited ("HACTL"). It was further submitted that AA had no standing to scrutinise the work done by HACTL's contractors, namely Murata Machinery (HK) Ltd. and Mannesmann Dematic AG Systeme. Under the franchise agreement whereby AA granted a franchise to HACTL to operate as a cargo terminal operator in the new airport, HACTL was to report and to permit specified inspections by AA's designated representatives. Where proactive monitoring was called for, AA did not shrink from pouring all necessary resources into the task. Counsel also argued that the provisions of section 6(2) of the Ordinance did not impose duties on AA to ensure that there would be safe and efficient movement of air passengers, aircraft and air cargo. The term “shall have regard” to these subjects in section 6(2) only made them AA’s primary targets in operating the new airport. It was further argued that given the respectability of HACTL and the apparently satisfactory nature of its progress reports, verified so far as possible by observation of activities on site, AA did enough by way of monitoring and should not be criticised for failing to penetrate what might represent a misleading picture presented by HACTL.

5.21 The Commission accepts that AA’s duty under the Ordinance may not give rise to a civil liability. Nonetheless it is a duty. Section 2 of the Ordinance expressly defines *functions* as including powers and duties, and as AA’s function under section 5(1) of the Ordinance is to maintain Hong Kong’s status as a centre of international and regional aviation, by providing, operating, developing and maintaining an airport for civil aviation, there is a duty for it to have regard to those primary objectives as set out in section 6(2). For the purpose of this inquiry, it does not matter whether the duty is called duty or whether it is called target purpose or objective. The duty is to have regard to those objectives. Having regard means having appropriate and sufficient regard, not merely having thought about an objective and then forgetting it or not making much effort in having it carried out. These objectives, the safe and efficient movement of passengers, aircraft and air cargo, are fundamental elements of an efficient airport to which sufficient weight has to be given. As far as air cargo movement is concerned, whether it is sufficient to award a franchise to a reputable franchisee is a matter of degree. Whether monitoring is required and the extent of the monitoring required is also a matter of degree. In the present case, where the franchise agreement makes provisions for the possible termination of the franchise in case of unsatisfactory performance on the part of the franchisee, AA must to a certain extent maintain its position and power in having regard to the safe and efficient movement of cargo in the new airport. If the provision of the services entrusted to the franchisee fails, is AA entirely without responsibility? How about its assurances given to Government that the new airport was ready for operation on AOD? What about the public's expectation that the new airport provided by AA for Hong Kong would be a world-class one, and the new airport's featuring in the reputation of Hong Kong as a whole? While certain monitoring work had been performed over the construction works of HACTL's SuperTerminal 1 ("ST1") with the necessary expertise, why should there be no expertise regarding the systems development, installation and testing? What exactly happened was that the monitoring work was only done partially, mainly over the construction works but little over the systems. If, for example, a person with expert knowledge of cargo handling systems had monitored the testing of the Cargo Handling System ("CHS"), at least HACTL and AA could have been warned of the absence of a sufficient throughput test for the Box Storage System, part of CHS. Another aspect was that AA had given assurances to ADSCOM that the new airport (which must be inclusive of HACTL's services) would be ready on AOD. Since AA did not monitor the systems of HACTL effectively or at all, AA should have warned ADSCOM that there was no monitoring over the systems or that AA possessed no expertise for such monitoring, for otherwise the assurances would be defective and tend to be misleading. For this partial monitoring and for the failure to warn ADSCOM when the assurances were given, AA was in breach of its duties.

(b) ADSCOM

5.22 Government established ADSCOM chaired by the Chief Secretary to make strategic and policy decisions regarding the ACP, which included the project to build the new airport. Government, as the initiator of the ACP which involved a colossal investment of public funds, needed to take steps to ensure that these infrastructure works would be carried out within budget and on time. Apart from the Chief Secretary, the other members of ADSCOM are as follows:

Financial Secretary
Secretary for Economic Services
Secretary for Planning, Environment & Lands
Secretary for the Treasury
Secretary for Transport

Secretary for Works

5.23 ADSCOM's terms of reference were not stated in any legislation, but can be found stated in slightly different terms in various documents. In ADSCOM Paper 1/90 of February 1990, the terms of reference of ADSCOM were stated as follows:

(1) to review the general progress of the new airport project and associated works, including the transport infrastructure; and

(2) to resolve problems referred to it by policy secretaries.

The role of ADSCOM was also described in subsequent ADSCOM papers:

(3) "ADSCOM has the overall responsibility for establishing policy, guiding the implementation of the ACP projects and coordinating action taken by the Hong Kong Government with regard to the Memorandum of Understanding Concerning the Construction of the New Airport in Hong Kong and Related Questions" [para 3 of ADSCOM Paper 29/91 of August 1991];

(4) "Since the drawing up of the AOR will run into different policy areas, and since the smooth opening of the new airport is essential to Hong Kong, ADSCOM is best placed to be the overall monitor. The PAA/AA should submit regular progress and funding reports through NAPCO to ADSCOM. Should there be issues which, for reasons beyond PAA/AA's control, are threatening to hold up the CLK AOR, or matters which cannot be resolved at the working level, NAPCO would in the first instance, refer them to the relevant policy secretary for resolution at an existing forum. If that fails, NAPCO would then escalate the matter to ADSCOM for resolution." [para 20 of ADSCOM Paper 45/95 of October 1995]; and

(5) "Significant policy issues and matters affecting more than

> one Policy Branch are subject to collective decisions at ADSCOM which has the overall responsibility of overseeing the smooth implementation of the ACP and coordinating actions taken by the Hong Kong Government with regard to the MOU." [para 2 of ADSCOM Paper 49/91 of December 1991]. (MOU means the Memorandum of Understanding)

In paragraph 6 of her statement to the Commission, the Chief Secretary described the role of ADSCOM as follows:

> "As a policy group and co-ordinating body, ADSCOM has a wide remit for the 10 mega infra-structural projects constituting the ACP … For these 10 projects, ADSCOM provides an overall steer on issues with significant policy or resource implications. ADSCOM oversees progress and cost control but does not concern itself with matters of an operational nature."

5.24 ADSCOM had the overall steering responsibility for the planning and implementation of the 10 ACP projects, including the new airport, on critical issues on policy and resources. It would also intervene to resolve any impasse, if any, between Government departments amongst themselves and between them and AA.

5.25 As AA is to be the builder and operator of the new airport, all the duties and functions of the Civil Aviation Department ("CAD") of the Government regarding airport operations and management, save air traffic control, which the department was administering at Kai Tak, were to be transferred to AA upon the opening of the new airport. There are yet many services required for the operation of the new airport that will be performed by Government departments. For instance, CAD has to deal with air traffic control, the Immigration Department has to perform passenger immigration, entry and exit functions, the Customs and Excise Department has to ensure duty clearance of imported and exported goods and passenger belongings, the Police has to maintain public order and the Fire Services Department has to ensure fire safety and protection. The involvement of Government departments in the operation of the new airport meant that their presence in the new airport would have to be catered for, with premises to house their officers and facilities to enable them to perform their functions. While direct communication with the various concerned Government departments would be engaged in by AA, Government set up NAPCO to ensure that there was full coordination between the departments and AA, and to resolve any difficulty that might be encountered in such coordination. NAPCO was also to monitor the performance and progress of the new airport project and act as the executive arm of ADSCOM.

(c) NAPCO

5.26 Apart from para 20 of ADSCOM Paper 45/95 (paragraph 5.23(4) above) in which reference was made to NAPCO, NAPCO's role and responsibilities can also be found in other ADSCOM papers, as follows:

(1) "NAPCO serves as the executive arm of ADSCOM and is responsible for the overall management of project implementation and co-ordination. NAPCO gives advice and guidance to departments in respect of the resolution of interface issues and, ensures the timely completion of the projects and that approved ACP policies and procedures are followed. In conjunction with Finance Branch, NAPCO will also exercise overall project cost control and contingency fund management across the ACP projects (except the airport, AR and WHC)" [para 2 of ADSCOM Paper 49/91 of December 1991]. (AR means the Airport Railway and WHC means the Western Harbour Crossing)

(2) "NAPCO … would have 2 general areas of responsibilities related to the implementation of the ACP projects. They are the overall management of project implementation and coordination and, the Government's public information and community involvement programmes … In addition, there would be other areas of NAPCO responsibility related to the overall coordination of the ACP projects such as a clearing house for contract administration, project insurance, mediation services and importation of labour." [para 5 of

ADSCOM Paper 29/91 of August 1991];

(3) "NAPCO would provide overall programme management services in coordinating and guiding the implementing Departments and Agencies as required to resolve interface issues, control overall ACP costs, assure timely completion of the projects and carrying out approved ACP policies and procedures." [para 9 of ADSCOM Paper 29/91];

(4) "NAPCO's Programme Management responsibilities would include:

(a) Establishment of ACP project procedures,

(b) Coordination of interface issues and resolution of conflicting requirements between Departments,

(c) Oversee detailed coordination between Government and other interfacing non-Government ACP projects,

(d) Review of project scopes and budgets to assist Finance Branch in maintaining budget control,

(e) Development and up-dating of a Baseline Implementation Plan, trend programmes and expenditure forecasts,

(f) Monitoring and control of scope, cost and programme,

(g) Recommending corrective actions and expediting critical decisions,

(h) Recommendation on the allocation of financial and staff resources,

(i) General review and coordination of contract document formulation, contract administration and construction management,

(j) Provision of technical specialists and administrative support on an as needed basis, and

(k) Other duties as directed by the Chief Secretary/ADSCOM."
[para 11 of ADSCOM Paper 29/91];

(5) "On the government side, at least 16 departments have been identified as likely to play some role in preparation for AOR. Most of the departments have no in-house programming capability. NAPCO will therefore assist departments in the preparation of their programmes while they deal directly with the PAA/AA over the planning for AOR. NAPCO will however assist in conflict resolution between the PAA/AA and Government departments." [para 21 of ADSCOM Paper 45/95 of October 1995];

(6) "At present, no single budget has been assembled for the AOR although the PAA has identified a small sum for this purpose which is part of their Head Office budget for 1995/96. Government departments will presumably rely on their departmental budgets for this purpose, which are outside the scope of the $158.2 billion ACP works budget. NAPCO will continue to monitor PAA's overall airport development budget which includes provision for the AOR, and will assist departments to identify AOR requirements." [para 22 of ADSCOM Paper 45/95];

(7) "As executive arm of ADSCOM, NAPCO will monitor the progress and funding position of the AOR, liaise with PAA/AA on problem areas (whether on programme, cost or interface issues) and refer matters to policy secretaries and ADSCOM as appropriate for speedy resolution." [para 23 of ADSCOM Paper 45/95];

5.27 From all the documents referred to above, it can be seen that

NAPCO had a number of roles to play with various responsibilities relating to ACP. Putting them in the proper perspective within the scope of the Commission's inquiry, merely relating to the new airport, NAPCO's main role and responsibilities were to

(a) act as the executive arm of ADSCOM;

(b) monitor the progress of the new airport project; and

(c) coordinate the interface between Government departments and AA.

5.28 In her letter dated 20 November 1995 to the concerned Government departments and policy bureaux, the Chief Secretary stated: "The Provisional Airport Authority (PAA)/future Airport Authority (AA) will be responsible for drawing up and implementing an Airport Operational Readiness (AOR) programme. It will co-ordinate with all agencies involved to consolidate and agree on a comprehensive list of tasks ahead, and manage the implementation of the entire AOR programme to ensure that the airport is ready, in all respects, to open on schedule."

5.29 About 16 Government departments were identified as having something within their jurisdiction and ambit that related to the new airport, and NAPCO's task under (c) in paragraph 5.27 above is to coordinate between these departments and AA. In case NAPCO could not resolve any interface problems, it would resort to ADSCOM for assistance.

5.30 NAPCO's roles and responsibilities under (a) and (b) in paragraph 5.27 above are closely connected. In ADSCOM Paper 45/95 of October 1995, it was stated "since the smooth opening of the new airport is essential to Hong Kong, **ADSCOM** is best placed to be the **overall monitor**" and that "As an **executive arm of ADSCOM, NAPCO** will monitor the progress and funding position of the AOR" (see paragraphs 5.23(4) and 5.26(7) above.) It was because NAPCO was the executive arm of ADSCOM that NAPCO was responsible to monitor the progress of the works for making the new airport ready for opening.

However, NAPCO's role was that of an overall monitor, as it was performing duties on behalf of ADSCOM as the latter's executive arm. W33 Mr KWOK Ka Keung, the Director of NAPCO since January 1998, told the Commission that NAPCO's monitoring over AA was one on a high level because AA was responsible to operate the airport under statute. NAPCO's monitoring was proactive to the extent that was practicable but not being offensive, so as not to spoil the good relationship at the working level between NAPCO's staff and AA's personnel. NAPCO should not operate above the law and interfere with AA's work. Further, AA had a team of 550 staff while NAPCO only had 38 professional officers many of whom were deployed for duties other than the new airport. NAPCO, according to W33 Kwok, would not look for detailed operational procedures and contingency plans that AA might have, for otherwise that would be beyond NAPCO's mandate.

5.31 W36 the Chief Secretary testified that the underlying policy of deciding on AOR was to have the new airport operating safely, securely, efficiently and smoothly. ADSCOM had never resiled from those criteria through the course of its examination of the readiness of the new airport to open on AOD, from the time before the decision was made right up to AOD. She described the role of NAPCO as one of a critical observer over AA regarding the development of the new airport and AOR. A critical observer is one that observes and critically assesses what one has observed. Notwithstanding the statutory functions of AA to plan, develop, operate and manage the new airport, Government was the body that decided on AOD, as that involved the interest of the Hong Kong community as a whole. Before the decision on AOD was made, ADSCOM required NAPCO's assessment of AOR, and based on that assessment also asked AA to provide answers to various matters of concern that might affect AOR. As referred to above, AOR means that the new airport would have to operate safely, securely, efficiently and smoothly. After the decision was made in early January 1998, Government still maintained NAPCO as a critical observer of the progress in order to ensure the four criteria would be met.

5.32 The Commissioners find that NAPCO was rather in the position of an interested and critical observer instead of a supervisor, controller or auditor, in that it would observe the progress of the works, assess the progress critically, give comments on the progress, sometimes provide advice when sought, while not giving nor able to give orders, directions or instructions that may affect AA's autonomy as conferred by the Ordinance. It was because of NAPCO's position as ADSCOM's executive arm under (a) in paragraph 5.27 that NAPCO reported the progress of the works, and in particular issues critical to AOR to ADSCOM and kept ADSCOM apprised of matters related to those issues. Yet, while NAPCO might advise ADSCOM of such issues and NAPCO's own views on them, neither it nor ADSCOM would act in any manner to interfere with AA's autonomy, which was to establish and run the new airport in accordance with prudent commercial principles.

5.33 ADSCOM's overseeing the progress of the new airport, through its executive arm NAPCO, must be seen in the light of AA's independence and autonomy and also that ADSCOM as well as NAPCO were not involved nor were empowered to get involved in the day-to-day running of the new airport project, which was entirely a matter for AA. Apart from matters of public interest and international obligations, in respect of which power is conferred by various sections of the Ordinance referred to in paragraph 5.14 above for Government to act or intervene, ADSCOM and NAPCO had no authority to deal with the development, maintenance and management of the new airport which were left entirely with AA. The evidence received by the Commission also bears out this situation. Where NAPCO identified a delay or a problem with the progress of the new airport project affecting AOR, it could and did draw it to the attention of AA since no one other than AA could either accelerate the progress or resolve the problem. NAPCO could not direct AA to do either, let alone seek to accelerate the programme or resolve the problem on its own accord and with its own resources. Where the delay or problem persisted and thus had a bearing on AOD or AOR, NAPCO would raise it with ADSCOM so that the matter could be resolved at that level. Where the problem as raised at the level of ADSCOM was addressed by AA and an assurance given, unless the assurance was blatantly incorrect or untrue, it would be unrealistic and difficult for ADSCOM or NAPCO to challenge it granted the limitation of ADSCOM and NAPCO in not being closely and directly involved with the project. Challenging such an assurance would also require employment of resources. Had either of these two bodies attempted to do so, it would involve at least two undesirable or illegitimate consequences, namely, having to lay out expenses from public funds for the purpose of falsifying AA's assurance, which might or might not succeed, and interfering with AA's independence. Either of these consequences would certainly have generated serious criticisms and could hardly be justified in view of the fact that trusting reliance should be placed on AA and its numerous professional officers and specialist contractors in handling the project ably and that the autonomous status of AA as entrenched by the Ordinance must be respected.

5.34 Counsel for the Commission propositioned that ADSCOM was in the position of a "de facto" AA Board in respect of matters which were AOR critical as it had exercised overriding control over the AA management. From the evidence, the only true intervention by ADSCOM was its decision on AOD. Even on the significance of having a standby FIDS as a fall-back in case of the failure of the main FIDS, it only recommended to AA to have it commissioned, in view of the instability of the main FIDS throughout the tests that had been gone through up to March 1998, although in the notes of the ADSCOM Meeting on 21 March 1998, this recommendation was termed a final decision to be made by ADSCOM. W46 Mrs Elizabeth Margaret Bosher said that the duty of AA towards ADSCOM was primarily to report on progress, and ADSCOM could insist on the quality of the reporting. This view is consistent with section 19(1) of the Ordinance, which reads:

> "The Authority shall supply the Governor with such information relating to any of the Authority's … affairs as he may from time to time require."

5.35 Nonetheless, from the evidence, it is clear that sometimes the directive word "instructed" was recorded as used when ADSCOM wished the AA management to do something, and W45 Chatterjee, W43 Oakervee, and W44 Heed thought that ADSCOM was "an overriding body" or one whose wishes should be seriously taken into account. That was basically due to the fact that ADSCOM represented Government and in turn represented the public in seeing that Hong Kong should have a world-class international airport. In the opinion of the Commissioners, however, this does not make ADSCOM a de facto Board of AA, as counsel for the Commission put it.

5.36 AA is a statutory corporation empowered to provide and operate the new airport. All the necessary functions for such purposes are vested by the AA Ordinance in the AA Board which is allowed to delegate to the AA management. There is one thing that is not mentioned in the Ordinance, which is who is to make the decision on the opening of the new airport for operation. That was apparently reserved for Government and the decision fell to be made by ADSCOM. This was perhaps foreshadowed by ADSCOM Paper 29/91 which reads:

> "A number of ACP projects are, or are intended to be, assigned to a private sector agency for implementation. They include the PAA (Provisional AA) for CLK Airport, MTRC for the Airport Railway and, a Franchisee for the Western Harbour Crossing. In each of these cases the particular Agency will be independently responsible for the financing, as well as the development and implementation of the projects. Their responsibilities relative to the ACP projects will be detailed in the enabling legislation and agreements with Government. In overall (macro) programming terms, however, there is a need for the Government at ADSCOM level to exercise on-going monitoring and, as and when necessary, in the overall interests of Hong Kong, to take decisions affecting those agencies. In that connection, NAPCO will need to maintain close liaison with them."

The decision on AOD was in fact made by ADSCOM after very careful and close consultation with AA. The purpose of the consultation was to ensure that the new airport would be ready on the opening date to be nominated by ADSCOM. As a responsible Government which ADSCOM represented in this matter, the opening date must be based on a cautious and reasonable assessment that the new airport would be ready when it was to open for operation. For that, ADSCOM continued to meet to satisfy itself that the objective of a safe, secure, efficient and smooth airport would be achieved on AOD, and NAPCO carried on with its monitoring exercise over AOR issues. All these activities and the respect shown by the AA Board and management towards ADSCOM's wishes do not establish a reasonable basis and should not be properly used as such for attributing to ADSCOM the position of a de facto AA Board, nor to increase the duties of Government or ADSCOM so that it guaranteed that the new airport would be operational ready on AOD. To consider otherwise would ignore the Ordinance which entrusts and empowers AA and nobody else with the functions of providing and operating the new airport.

5.37 Despite the presence of a number of Government representatives on the AA Board, there is no evidence that Government attempted to control AA or that it used the official members on the Board to monitor the operational readiness of the new airport. Indeed, on the proper date for airport opening, official members of the Board abstained from voting for the Board to make a recommendation to ADSCOM.

5.38 Counsel for the Commission relied on Article 128 of the Basic Law to argue that Government had the duty to ensure the provision of an operational and efficient airport, including an efficient air cargo handling service. Article 128 provides:

> "the Government of the Hong Kong Special Administrative Region shall provide conditions and take measures for the maintenance of the status of Hong Kong as a centre of international and regional aviation."

5.39 The Commissioners do not accept that Article 128 imposes a duty on Government as argued by counsel. On the other hand, the enactment of the Ordinance, that established AA as a statutory corporation with the functions of providing and operating the new airport with the objectives of maintaining Hong Kong as an international and regional hub of civil aviation, can and should properly be considered as part and parcel of the "conditions and measures" required by Article 128 to be taken by Government. In establishing AA through the enactment of the Ordinance by the Legislative Council, Government had also taken into account that as a statutory corporation, AA would eliminate or reduce bureaucratic constraints and delays in developing and running the airport and enhance the opportunities and efficacy of raising loans for those purposes. These two objectives could hardly be achieved if Government itself were to build and operate the new airport.

5.40 Nonetheless, counsel for the Commission were correct in pointing out that Government must see to it that AA would discharge its duties. This is because that Government had decided on AOD, and by this decision alone, Government should not only have assessed that AOD was a date that the new airport would be ready for efficient operation, but should also be satisfied that AA would discharge its duties of providing an efficient airport for Hong Kong on AOD after the decision on AOD was taken. In the opinion of the Commission, however, this role of Government through ADSCOM was subject to two limitations: the importance of observing the law and the proper use of public funds, both of which are vital to the public interests. As AA is the statutory authority in the form of a corporation in charge of the affairs of the new airport, any undue interference by Government would be an unjustified and even unlawful usurpation of AA's statutory functions and obstruction of AA's autonomy. The importance of Government and everybody else respecting the law does not need any explanation. It is also important that public interest demands that public funds should not be expended except for good reasons. ADSCOM's overall monitoring of AA's work and the progress of the airport project was performed through NAPCO, the executive arm of ADSCOM. The overall monitoring was to enable Government to keep an eye on AA in discharging its functions under the Ordinance for the purpose of satisfying Government that there would be an efficient new airport on AOD. If the monitoring role of NAPCO were to take a full audit of the development of the new airport or to supervise AA's performance from time to time, NAPCO would have to employ a large number of professionals and experts to examine every step taken by AA and its contractors. That would undoubtedly duplicate the efforts and expenses that AA was incurring, and would therefore be unjustifiable and unnecessary in the interest of preserving public funds. Thus, it is reasonable for NAPCO not to employ resources to examine the operational and procedural details that AA planned for the running of the new airport, insofar as AA's plans produced for NAPCO's scrutiny were satisfactory under critical examination.

5.41 As W36 the Chief Secretary said in evidence, NAPCO's monitoring role was that of a critical observer which, the Commissioners consider, struck a fair balance between the conflicting considerations. On the one hand, Government had to be satisfied in the interest of the public that on AOD there would be an efficient new airport. On the other hand, Government had to respect the law by not unduly interfering with the statutory autonomy of AA and also had to protect public funds from being unnecessarily spent for fully auditing the work of AA and delve into its procedural and operational details when AA had its own large professional teams and consultants.

5.42 This role of a critical observer of NAPCO is, however, not limited to evaluating the progress of the development of the new airport through AA's reports on various AOR critical issues, as counsel for Government argued, but should cover the examination of the progress by NAPCO's own professional staff. This role of NAPCO is not merely the Commissioners' opinion, but is borne out by the evidence. NAPCO did have its professional staff from Government departments and from International Bechtel Company Ltd. ("Bechtel") which was a company of airport consultants that it employed, very often on site, to monitor the progress of the construction and system development works in PTB and ST1, not merely relying on AA's reports on the progress.

Section 3 : Communication and Coordination Channels

5.43 The new airport was only one of 10 major infrastructure projects comprising the ACP under NAPCO's monitoring responsibility. There was a distinction in NAPCO's role in relation to the Government versus non-Government ACP projects, the latter including the new airport. In regard to the former, Government had direct involvement. The Government works agents were subject to procedures and administrative controls imposed by NAPCO, as well as ACP conditions of contract authored by NAPCO. NAPCO was in a strong position to recommend remedial measures when delays or problems were identified. For the new airport, AA being an independent statutory corporation managed its contracts and works directly under its own professional management. NAPCO's role was limited to reviewing AA's plans and programmes, monitoring overall progress on site, and flagging up problems or potential problems to be followed up by the Project Manager of NAPCO, Director of NAPCO and ADSCOM in consultation with the AA management. NAPCO was not a party to AA contracts and franchises, and had no direct say in the performance of the AA contracts. Although AA provided information to NAPCO for overall monitoring purposes, NAPCO did not have unrestrained access to all AA contract documentation. Further, NAPCO only had a limited coordination and field staff to carry out monitoring assignments, including only five field staff who were primarily responsible for monitoring Government works at the new airport.

5.44 For the purposes of the inquiry, the Commission concentrated on the roles and responsibilities of AA, ADSCOM and NAPCO in respect of FIDS and HACTL, the two major problems that have been identified as having the greatest impact on the operation of the new airport on AOD. FIDS is the computer system installed in PTB for the provision to users of information about flights coming in and going out of the new airport, and HACTL is the main cargo handling franchisee that is responsible for about 80% of all the cargo that would be moved through the new airport. After Government through ADSCOM had decided and announced 6 July 1998 to be AOD, NAPCO continued to play a role in relation to AOR. NAPCO acted as a focal point for all Government departments involved in the AOR process, and monitored AA in its planning and implementation of the overall AOR programme.

5.45 Regarding HACTL, NAPCO's role was predominantly limited to monitoring the monthly reports produced by HACTL for AA in accordance with their Franchise Agreement; for other franchisees, NAPCO relied on AA's own monthly reports. In the nine months or so prior to opening, however, NAPCO became involved in detailed exchanges with AA and with HACTL in respect of HACTL, on account of the serious delays being experienced with the Government facilities and systems in ST1.

5.46 To discharge its functions, NAPCO's "Airport" team was divided into working groups, each headed by an Area Manager, who reported to the Chief Coordinator, Mr John Lloyd Smith. The areas covered by the working groups included:

(a) AA Building Works, including Government entrustments;

(b) directly funded Government works, including stand-alone buildings and entrustments to Franchisees;

(c) Airport Systems; and

(d) AOR.

5.47 The entirety of the working groups was made up of up to 16 staff, nine of whom were from Bechtel. The responsibilities of Bechtel were contained in the Consultancy Agreement No. CE 85/95 between Bechtel and Government, dated 1 February 1996. In accordance with this Agreement, Mr Tudor Walters, who became the Consultant Project Manager of NAPCO, was directly responsible to the Director of NAPCO. On technical matters, Mr Walters generally advised ADSCOM directly at its regular meetings and became directly involved in the discussion of such matters as they arose with other parties at ADSCOM. He was in attendance at almost all ADSCOM meetings between 1 February 1996 and 6 July 1998, providing his assessments of the situation and recommendations from time to time. The assessments and recommendations were based on his judgment, his perusal of relevant documentation and discussions held with many of the directly involved parties. During the nine months prior to AOD, the AOR working group was augmented by the addition of W32 Mr Jhan Schmitz of Bechtel as the Deputy Consultant Project Manager who led the AOR group up to AOD. As from January 1997, three of the Bechtel staff were based in CLK to specifically monitor the progress of (a) fit out works in PTB, (b) Government Entrusted Works in franchisee buildings and (c) systems installation, integration and testing.

5.48 The following were routinely produced as part of NAPCO's airport project management process:

(a) Weekly Situation Reports on Key Issues and Critical Items prepared by NAPCO for ADSCOM circulation ("Weekly Situation Reports").

(b) Weekly Site Reports produced by Senior Engineers based at CLK to the Chief Co-ordinator of NAPCO("Weekly Site Reports").

(c) Detailed Fortnightly Reports (produced roughly over the last 12 months before AOD) on Airport Key Issues and Critical Items for discussion at the NAPCO Directorate Meeting ("Bi-weekly CLK Reports").

(d) ACP Monthly Progress Reports, prepared on the basis of routine reporting from work agents and NAPCO's overall schedule, budget and interface management perspective ("ACP Monthly Progress Reports").

(e) Detailed Reports and Presentations on Airport Critical issues and AOR prepared by AA with NAPCO's comments for ADSCOM's consideration.

(f) Minutes of technical meetings with AA (and HACTL).

(g) Key correspondence with the AA, including letters from Mr Walters to AA's Project Director, W43 Oakervee.

5.49 NAPCO was ADSCOM's executive arm. The Director of NAPCO was a member of the AA Board. The Secretary for Works, a member of ADSCOM, was also a member of the AA Board. While NAPCO was performing overall monitoring of the airport project, amongst the ACP projects, the Works Bureau ("WB")(then the Works Branch), sometimes also monitored those AA's works which gave rise for concern. For the purposes of such monitoring, reports were prepared by AA, WB, NAPCO and its officers. The reports or a gist of them were submitted to ADSCOM. After receiving these reports, and other papers for ADSCOM prepared by NAPCO, ADSCOM had meetings on the new airport about once every two weeks. These reports were the main channel of communication between ADSCOM with the other bodies. There were the following reports:

(a) NAPCO's senior engineers on site submitted Weekly Site Reports to the Chief Coordinator of NAPCO.

(b) Bechtel's professional staff seconded to NAPCO submitted Bi-weekly CLK Reports to NAPCO.

(c) AA submitted the following reports to NAPCO, namely, draft ACP Monthly Progress Reports, monthly progress reports, monthly construction reports and HACTL's ST1 monthly progress reports.

(d) From (a), (b) and (c) above, NAPCO submitted to ADSCOM Weekly Situation Reports, ACP Monthly Progress Reports, ADSCOM Papers, Chairman's Briefs and other documents prepared by NAPCO.

(e) AA submitted ADSCOM Papers and other documents prepared by AA to ADSCOM.

(f) WB submitted to ADSCOM a Situation Report on AOR.

The channel of the documentary communication can be seen in **Appendix VI**.

5.50 There was no direct communication between Government bodies and HACTL, save on matters connected with the Government entrusted works to be carried out in ST1. However, apart from submitting the reports and papers to NAPCO and ADSCOM referred to in sub-paragraphs (c) and (e) of the preceding paragraph, AA also allowed NAPCO staff to participate in technical meetings between AA and HACTL.

5.51 Within AA, there are various divisions under W3 Townsend as the CEO, each responsible for a certain area of work. An organisation chart of AA is at **Appendix VII**. There does not appear to be anything wrong with the structure of the organisation within AA. Communication within AA should have little problem as the staff of all the relevant divisions, notably PD and AMD, for the building and running of the new airport were at CLK. Their coordination was, however, problematic, and will be briefly alluded to in the next section and more fully dealt with in Chapter 17.

Section 4 : Adequacy of Communication and Coordination

5.52 Communication and coordination between various divisions in AA were not satisfactory. That was noted by NAPCO staff who were, for the purposes of monitoring, at the site in CLK.

5.53 The deficiency of coordination within AA was noted by NAPCO in various records. In ADSCOM Paper 34/97 by NAPCO dated 19 September 1997, it was stated that NAPCO found that coordination within the AA itself, particularly between AMD and PD and the Commercial Division, as well as coordination and cooperation between AA, its business partners, Government and all others required intensified attention and immediate improvement. The coordination and cooperation between AMD and PD was particularly important from about this time, as the new airport was transitioning from the construction stage to the operation stage, the responsibility of PD in relation to the construction and system works was in the course of being handed over to AMD. AMD was eventually to use the works and systems developed under the auspices of PD, and AMD had to operate the services and facilities so provided for the purpose of running the new airport.

5.54 The point was made in the 170th ADSCOM meeting on 20 September 1997: "AMD should be in the driving seat of the airport project at this point in time, but because of the personalities involved, it was being pushed round parameters set by PD and had yet to gear itself up." The Deputy Director of NAPCO advised that W3 Townsend should, but did not, quickly and firmly resolve this problem.

5.55 The notes of the ADSCOM special meeting on 7 November 1997 also recorded DCA as saying that he had no faith in the top management of AA. The project was driven by the Project Director W43 Oakervee who always tried to bulldoze his way through. W3 Townsend was not in control and the organisation was not functioning as it should.

5.56 NAPCO also recorded the lack of cooperation from AA in its Weekly Site Report of 7 March 1998. NAPCO's attempts to find out what was going on regarding systems integration during the period were continually thwarted because AA staff were warned not to say anything. It was not surprising that NAPCO started to distrust AA. NAPCO further reported that AA would claim that, "all the scheduled tests were completed"; however, the reality was that the system could not yet display flight information at a number of locations.

5.57 In its Weekly Situation Report of 1 May 1998, NAPCO reported that it had still not received the AA's quantification of additional requirements for the contingency plan in case of FIDS failure, as promised.

5.58 Another week passed by, NAPCO again reported that AA claimed to have corrected many of the FIDS critical software issues and resolved the Societe Internationale de Telecommunications Aeronautiques (Common User Terminal Equipment) /FIDS interface problems with implementation at site continuing. However, a number of software issues, which AMD stated as critical, were still outstanding and this raised concerns on AA's ability to establish Day One operating scenario. AA was developing the contingency FIDS with General Electric Company (Hong Kong) Ltd and Hong Kong Telecom CSL Limited("HKT") but the time available for development was short. Work to interface FIDS with other systems such as Airport Operational Database ("AODB"), Baggage Handling System, etc continued and updates to AODB software was due in mid May. NAPCO had been chasing AA but had still not received its quantification of additional data transfer requirements [NAPCO Situation Report, 8/5/98].

5.59 In the ADSCOM Chairman's brief prepared by NAPCO and at the 183rd meeting of ADSCOM, both of 22 may 1998, NAPCO pointed out that by opening, the airport systems would largely operate on standalone mode. It was clear from the AA report that lots of integration were still underway and programmed for completion by the end of May 1998. ADSCOM had been assured that systems existed for manual data transfer. However, as most systems had to be operated on a standalone basis, more staff, procedures, etc, had to be organised. The quantification of what this involved in terms of equipment, staff, changed procedures, training, etc which NAPCO had been after for months had yet to be forthcoming from AA. In the Summary of Critical CLK Issues, dated 19/6/98, NAPCO continued to state that the demonstration of the viability of workarounds, schedule and procedures of installing enhancements, system status etc were all expected in a detailed report which was still not yet received. NAPCO had yet to receive from AA the quantification of additional data transfer requirements under the contingency scenario.

5.60 As late as May 1998, the coordination between AMD and PD still caused concern. In the Weekly Report by NAPCO's Mr David Thompson for the week ending 23/5/98, he reported that in order to accommodate the new back up FIDS, AMD needed to have some more workstations, without which there would be problems for system development and training functions. In answer to a NAPCO question, concerning the reason why five additional workstations had not simply been purchased, it appeared that PD was not willing to spend money and AMD did not have access to funds.

5.61 There was also a coordination problem regarding the testing of Government entrusted works. In a memorandum dated 28/5/98 from W33 Kwok it was noted that the continuing delays in testing and commissioning of CAD systems were the result of ongoing AA installation, testing and commissioning problems with the AA primary systems. Thus, until the primary AA systems were fully functional and operational, CAD systems which were dependent upon the AA master system could not be adequately tested or commissioned.

5.62 W31 Mr James WONG Hung Kin, the Project Manager of NAPCO, gave evidence before the Commission about coordination between AA and NAPCO. He said that the very detailed internal project reports prepared by AA were originally only supposed to be available to the AA Board members. That practice was changed in middle of 1996. After that, AA was much more open to Government and shared with NAPCO its internal reports. From those working level reports, NAPCO staff on the site knew a lot more about the true picture in addition to having day-to-day contact with AA's working level staff. The relationship gradually improved a lot, particularly towards the end of the project. In the half year before AOD, AA was quite open towards NAPCO by allowing NAPCO staff to take part in the site acceptance tests and to visit Interface House which was previously quite closed to outsiders, including NAPCO. W31 Wong said that towards the end of the project, NAPCO generally had quite a good grasp about the progress of a wide spectrum of the AA works.

5.63 Regarding the structural arrangement of AA's organisation in the development of the new airport, W51 Mr Jason G YUEN, the airport expert appointed by the Commission, was of the view that consultants should have been employed within AA to oversee the works that were performed by contractors, so that they would monitor the works closely and report to the AA Board direct, apprising it of their views as a source independent of PD to assist the Board in assessing the quality and progress of the works. The situation in fact was that NAPCO as a separate and independent monitor was monitoring the works and reporting to ADSCOM, an outside and higher authority, with the result that the AA Board could not efficiently carry out its statutory task of developing the new airport. However, the lack of outside consultant to advise the AA Board, as opposed to the AA management, albeit desirable, is not established by the evidence as a cause to the problems on AOD and the Commission therefore opines that this subject should not be a matter for serious criticism. The Commissioners will return to this matter in the subsection dealing with the AA Board in Chapter 17. What contributed to causing the problems was that AA did not possess any expertise or employ any in examining the progress and effectiveness of HACTL's systems which formed part of the AOR programme. Had the AA Board or management retained consultants to monitor the development or at least the testing and commissioning of HACTL's systems, its assessment of the systems' readiness would have been on sound basis.

5.64 Both W36 the Chief Secretary and Chairman of ADSCOM and W33 Kwok maintained that NAPCO had sufficient resources to discharge its monitoring functions regarding AOR. In relation to the identified critical issues of FIDS and HACTL, apart from the Government staff that were assigned to it, NAPCO had the professional assistance from the Bechtel personnel who were experienced in airport matters. NAPCO also had professional staff on site to observe the progress of the works, which basically means observing the progress of construction works of both PTB and ST1 and the Express Centre. On the other hand, NAPCO had Bechtel to monitor FIDS and help it understand what was going on with FIDS. As far as HACTL was concerned, NAPCO did not have contractual relationship with HACTL which was putting up ST1 and the Express Centre and installing a CHS which it was developing in these buildings. CHS includes the equipment and computer systems. NAPCO's personnel could visually look at the completeness of the equipment installation but the development and readiness of the computer systems was not visible, at least not visible to the untrained eye. If NAPCO were to inquire into HACTL's systems, as opposed to merely observing the state of the construction works of HACTL's premises and the installation of the equipment, it would be without any contractual basis and might be affecting HACTL's proprietary interest in the systems. NAPCO therefore only relied on AA's monitor of HACTL's systems since it was AA that had to ensure AOR. NAPCO did not after all have the expertise in HACTL's CHS and it as well as ADSCOM assumed that AA must have such expertise in order to discharge its functions over HACTL relating to AOR. As HACTL and AA had never raised any concern or doubt about the operational readiness of HACTL's systems, NAPCO examined the progress of the construction works of HACTL's buildings and the installation of the equipment to assess the degree of HACTL's operational readiness, based on the fact that CHS was modular in design, in that each module could work independently and the cargo handling capacity depended on how many of the modules would be ready for operation on AOD. NAPCO assumed that the degree of completion of the buildings and equipment would be tantamount to the proportion of cargo handling capacity being ready.

5.65 The Commissioners accept that NAPCO's relationship with HACTL was different from that between AA and HACTL which affected NAPCO's role of monitoring over HACTL relating to AOR. HACTL was a franchisee of AA and had contractual obligations owed to AA, which enabled AA to oversee whether HACTL's CHS would be operationally ready for AOD. On the other hand, NAPCO could only monitor HACTL indirectly through AA, although when NAPCO was overseeing the progress of the Government works at the HACTL premises, it would also take the opportunity of observing the progress of the physical construction and installation.

5.66 The Commission opines, however, that in performing its functions under the role as found by the Commission, NAPCO failed in two aspects. First, it should have inquired with AA whether it had the necessary expertise in monitoring HACTL's progress relating to the installation, testing and commissioning of ST1's 5-level CHS equipment and systems, but it did not do so. Secondly, it should have checked whether AA had plans and contingency measures and should have had an overall assessment whether such plans and measures were adequate in view of the then prevailing circumstances. As a corollary, NAPCO should also examine if AA had an overall risk assessment.

5.67 These duties on the part of NAPCO could have been easily discharged without draining too many resources. Regarding the first duty, NAPCO should simply ask a question of AA. There was a missing link in NAPCO's monitoring of HACTL's AOR through AA, in that AA did not have sufficient expertise in assessing HACTL's systems in its CHS. NAPCO never inquired or ascertained whether AA had the necessary expertise in monitoring HACTL's systems, but merely relied on AA's assessment and HACTL's report to AA that the system was ready. Merely assuming that AA had the necessary expertise may, in the opinion of the Commissioners, be acceptable as far as ADSCOM was concerned, for it was relying on NAPCO to do the monitoring work and advise it, but the same is not acceptable vis-à-vis NAPCO. NAPCO had the monitoring and advising functions to discharge towards ADSCOM. NAPCO's assumption that AA was qualified to monitor HACTL's systems, on which NAPCO did not possess any expertise, and its failure to inquire if in fact AA was so qualified rendered risky NAPCO's reliance on AA's assessment and reflected a lack of attention to HACTL's systems as compared with the attention that NAPCO paid to FIDS. In this respect the Commission finds that NAPCO should be responsible for failing to discharge its functions fully to ADSCOM. Had NAPCO coordinated in a better manner with AA, NAPCO should also have asked this very pertinent question, and for this failure in communication, NAPCO is responsible. Having said that, it would not be reasonable to put too much blame on NAPCO relating to the failure of ST1, for that would primarily be the responsibility of HACTL who should provide the necessary cargo handling facilities on AOD as it had assured from time to time. For HACTL's responsibilities, please see Section 4 of Chapter 14. AA was also responsible for failing to ensure that HACTL was ready to provide the necessary cargo handling facilities on AOD. AA should have retained experts in the field to monitor if CHS would be operationally ready, and they are responsible for failing to do so, instead of merely relying on HACTL's words. Had NAPCO asked AA the question and found that AA did not have the expertise in understanding CHS being installed in ST1, NAPCO should and could warn ADSCOM of the deficiency enabling ADSCOM to decide whether it should urge AA to employ the necessary expertise.

5.68 For the second duty, the documentary evidence shows that NAPCO did request and press AA for contingency plans and measures, contrary to W33 Kwok's oral testimony. However, what NAPCO failed to do was to examine such plans and measures critically and warn ADSCOM (which warning would undoubtedly be passed onto AA) that there was no global contingency plan commensurate with the prevailing situation and possible risks identified. This approach would not have involved NAPCO in delving into AA's operational details, save where a critical examination of AA's plans and measures unearthed evidence that AOD was at risk. For instance, the risk of a possible failure of FIDS on AOD was exposed by the trials in January and February 1998 that had taken place showing its instability. When this was reported to ADSCOM by NAPCO, ADSCOM urged AA to commission a standby FIDS as a contingency. When NAPCO and ADSCOM knew that the standby FIDS, which was the contingency plan for the possible failure of the main FIDS, had been successfully tested, then it was satisfied that AOD could go ahead. As to when the standby was to be used and the procedure of how it would be invoked, those related to the operational details with which NAPCO and ADSCOM were not concerned, and the Commissioners opine rightly so. There was also a standby Stand Allocation System as a contingency measure for the possible failure of an integral component of FIDS, ie, the Terminal Management System, that would perform the stand allocation job. ADSCOM was also satisfied with this arrangement. The contingency of using Public Address System to make announcements and whiteboards to show flight information was also a measure to disseminate updated information, when necessary, during the interval when there was to be a switchover to the standby FIDS. However, no thought was given by AA to the situation in a global and overall manner, for instance, when the main FIDS failed and resort had to be made to the standby FIDS and whiteboards, whether the means of communications available were adequate in obtaining the necessary flight information and directing and disseminating the information to the parties requiring the same. The Commissioners are therefore of the view that NAPCO also failed in examining the contingency plans made by AA in a critical manner. There should also have been an overall assessment of the risks involved in opening the new airport for operation on AOD. This assessment would involve evaluating the risk of failure of the systems critical for AOR, what would be needed in the event of a failure of one system or another, and whether proper contingency measures had been put in place to cover the problems which might arise. AA should have made such an assessment, but admittedly did not do so. NAPCO could have asked AA if it had made such an assessment. Such an inquiry could have alerted AA. Had AA produced a report on risk assessment, NAPCO should also have examined it critically and advise ADSCOM accordingly. If, as the fact turned out to be, AA did not make such an assessment, NAPCO should have done it independently according to the knowledge of the progress that it had obtained from its own monitoring of critical AOR issues and AA's reports. This, however, NAPCO failed to do. This failure can be said to be an instance of lack of coordination with AA.

5.69 The Commissioners turn to examine the position of ADSCOM: whether it should be responsible for NAPCO's said failures. ADSCOM had assigned to NAPCO the duty to monitor the progress of the new airport, and the failure of duty on NAPCO's part in the two aspects mentioned above should not justly be a basis for attaching blame to ADSCOM because it is only fair and reasonable that ADSCOM expected NAPCO to fully discharge that duty. ADSCOM made an overall assessment of the readiness of the new airport at the end of 1997 when a decision on AOD was needed. The Chief Secretary as chairman of ADSCOM then wrote to W50 Wong, the Chairman of the AA Board, impressing upon him the importance of the new airport being ready with safe, smooth and efficient operation when it opened. In that letter of 15 November 1997, detailed questions were set out covering AOR critical subjects for AA to answer. The request was for an "honest assessment" by AA. After careful consideration of all matters raised, AA assured ADSCOM that the new airport would satisfy the requirement of safe, smooth and efficient operation at the end of April 1998. Even with that assurance, ADSCOM decided that AOD should be in July 1998, having placed great importance on the availability of AR which would only be ready by the end of June 1998. Thus, a comfortable float was provided to AA from its recommended date of end of April to the beginning of July 1998. There is no evidence to suggest that AA's assurance of the new airport being ready at the end of April 1998 was not carefully or honestly made. In such circumstances, it would be unreasonable to regard that ADSCOM was rash or acting carelessly or improperly in deciding that AOD should be in July 1998.

5.70 Counsel for the Commission criticised ADSCOM for failing to re-assess the readiness of the new airport after it had reviewed the situation very carefully in January 1998 to make the decision on AOD. Since the decision was made and announced, ADSCOM continued to examine critical AOR issues. It continued to meet to examine the progress of these issues reported by AA and NAPCO. From time to time, it was given reassurances by both AA and HACTL that PTB and ST1 respectively would be ready on AOD. It would therefore be unreasonable to suggest that ADSCOM should repeat the assessment exercise every month or at any time after January 1998 unless there was clear evidence available to it that the July date was at risk. Yet, no such evidence was presented to it. On the contrary, there were the reassurances from AA and HACTL, which albeit were based on over-confidence on their part. The over-confidence is referred to in paragraphs 17.33 and 17.62 of Chapter 17. Nor did NAPCO advise ADSCOM that AOD was at risk or a deferment should be considered. NAPCO did not examine the contingency plans of AA critically or query AA as to whether an overall risk assessment had been made. However, there is no evidence that ADSCOM should have any reason to doubt that

NAPCO was discharging its functions of a critical observer dutifully. In June and early July 1998, AA also represented to ADSCOM that the main FIDS as a whole achieved 98.7% reliability, that the Access Control System and the Public Address System had been successfully tested, and that the standby FIDS had also been successfully tested. All these provided confidence to ADSCOM that AOD was safe. The problems surfacing on AOD were multifarious, compounding and feeding each other in a downward spiral, culminating in the chaos that no one, including all the experts and professionals involved in the works and in the assessment of the works, could have reasonably foreseen in all the surrounding circumstances. Although the Commission is able to find most of the causes for the problems facing AOD, that is done with the benefit of hindsight which was unavailable to the involved parties at the material times. It would be unfair to castigate anyone purely through the lens of hindsight, and the Commissioners have refrained from doing so.

5.71 One question, however, remains. As has been emphasised in paragraph 5.30 above, ADSCOM was the overall monitor of the progress of the development of the new airport and NAPCO as ADSCOM's executive arm was to monitor the progress of AOR. The relevant passages are repeated here for easy reference:

(a) "Since the drawing up of the AOR will run into different policy areas, and since the smooth opening of the new airport is essential to Hong Kong, ADSCOM is best placed to be the overall monitor. The PAA/AA should submit regular progress and funding reports through NAPCO to ADSCOM." [para 20 of ADSCOM Paper 45/95 of October 1995];

(b) "NAPCO serves as the executive arm of ADSCOM and is responsible for the overall management of project implementation and co-ordination." [para 2 of ADSCOM Paper 49/91 of December 1991]

(c) "NAPCO's Programme Management responsibilities would include: … (k) Other duties as directed by the Chief Secretary/ADSCOM." [para 11 of ADSCOM Paper 29/91 of

August 1991]; and

(d) "As executive arm of ADSCOM, NAPCO will monitor the progress and funding position of the AOR …" [para 23 of ADSCOM Paper 45/95 of October 1995].

5.72 It therefore appears clear that the duty of an overall monitor was ADSCOM's and not NAPCO's. However, as it had the power to do so, ADSCOM delegated the duty of the overall monitor of the progress of AOR to its executive arm, NAPCO, and directed it to discharge the duty.

5.73 The question on responsibility of ADSCOM can be framed in various ways:

(a) Does the delegation of the duty of ADSCOM as an overall monitor to NAPCO fully discharge that duty on the part of ADSCOM?

(b) Does the delegation absolve ADSCOM from any responsibility as an overall monitor?

(c) Is ADSCOM responsible for NAPCO's failures in discharging the overall monitoring duties as found by the Commission?

5.74 As said in paragraph 5.70 above, there is no evidence that ADSCOM should have any reason to doubt that NAPCO was not discharging its functions of a critical observer dutifully. W36 the Chief Secretary testified that she considered NAPCO had discharged its functions conscientiously. The Commissioners are satisfied that ADSCOM did not know that NAPCO had committed the two errors, namely, failing to ask AA the pertinent question whether AA had the necessary expertise to monitor the readiness of HACTL's systems, and failing to critically examine AA's contingency plans and query AA as to the existence of an overall risk assessment. If ADSCOM were duty-bound to inquire with NAPCO on these two areas, ADSCOM would be doing NAPCO's job or advising NAPCO as to how to do its job. That does not seem to be right, for an executive arm is to execute the decisions of the policy maker. The policy maker will decide on policies which will be carried out by the executive arm but is not supposed to advise the executive arm as to how to do its job. The executive arm is responsible for carrying out such decisions and the functions entrusted to it by the policy maker, and it is unreasonable to hold the policy maker responsible for the faults committed by the executive arm in the execution of the functions. On this analysis, it does not appear that after the delegation of the overall monitor's duties to NAPCO, ADSCOM should be responsible for NAPCO's failures in the discharge of such duties. Another perspective is to compare ADSCOM's position with that of the AA Board. The Ordinance imposes on the AA Board the duty to have regard to the efficient movement of air passengers and air cargo in operating the new airport. The delegation of such duty by the AA Board to the AA management does not appear to absolve it from being responsible if such duty has not been discharged, for the Ordinance looks upon the AA Board to discharge that duty, although at the same time allowing it to delegate. The duty is a primary duty that cannot and, in the opinion of the Commissioners, should not be discharged by mere delegation. Taking into account the importance of the readiness of the new airport on AOD to the Hong Kong public, in ADSCOM's own words "the smooth opening of the new airport is essential to Hong Kong", and bearing in mind that it was ADSCOM who made the decision on AOD and also that it was ADSCOM and ADSCOM alone in the circumstances that could make a decision to defer AOD, if necessary, the Commissioners come to the view that the responsibility as an overall monitor should not be allowed to be discharged by delegation. It should be considered as a primary and crucial duty, the ultimate discharge of which should rest with ADSCOM. The public also looks upon ADSCOM to have that duty discharged. In the premises, the Commissioners hold that ADSCOM should be responsible for NAPCO's failures, though not without some hesitation. The holding, however, does not mean that ADSCOM was at fault, for it did not commit any error in entrusting the overall monitoring job to NAPCO, its executive arm, nor did it commit any error in not advising how NAPCO was to do that job. Nonetheless, towards the public, its responsibility as the overall monitor of AOR was not discharged satisfactorily.

CHAPTER 6

AOD – DECISION, PREPARATION AND RESPONSIBILITY

Section 1 : Planning for AOR

6.1 Up till the decision was announced by Government in January 1998 that airport opening day ("AOD") for operation was to be on 6 July 1998, Airport Authority ("AA") had targeted April 1998 as the opening day, and everything in the development of the new airport was geared to this goal. AA originally planned for a clear trials period, that is, a period dedicated to training, trials and other operational transition activities following substantial completion of airport facilities and systems, and their hand-over to the operators. As stated in a letter dated 14 September 1994 from W43 Mr Douglas Edwin Oakervee, the Director of AA's Project Division ("PD"), to the then Director of New Airport Projects Coordination Office ("NAPCO"), W48 Mr Billy LAM Chung Lun, AA at the time planned a 7-month airport operational readiness ("AOR") phase, including a 4-month period for airfield trial operation upon completion of the runway and taxiways, and a further 3-month period for airport-wide trials following completion of airport commissioning and system integration.

6.2 Consistent with AA's planning, the Airport Trial Operations Strategy Document prepared in draft form by Mr Daniel Ough of AA in

1996 included a 4-month clear trials period, and stated that "Airport construction and testing must be complete before Airport Trial Operations commence to avoid trialing incomplete facilities".

6.3 By August 1997, a period during which acceleration measures were being planned and instructed by AA for the various systems contracts, AA continued to maintain a clear trials period. The period was then subdivided into a 1-month "Transfer to Operations" period and a 3-month "Airport Trials Period". While a number of works activities were extending into the 3-month clear trials period, all major works activities including systems installation, testing and commissioning were planned to be completed well in advance of the trials period.

6.4 In response to a request by Airport Development Steering Committee ("ADSCOM") at its meeting on 9 August 1997, NAPCO prepared an assessment of the AOR process for the new airport, with the cooperation of AA. NAPCO presented to ADSCOM its preliminary observations on 23 August 1997 and its findings and recommendations on 20 September 1997. The definition of AOR used as a basis of the assessment was as follows:

> "The AOR process encompasses all steps necessary to transition the new airport from construction, testing and commissioning through familiarisation, training, trials and relocation to ensure safe, smooth and efficient operations from the first day of airport opening, at a demonstrated and acceptable level of operational standard. This can only be achieved when the operator and all involved parties are fully familiar with the airport facilities, systems and procedures, and only after systems and procedures are reliable, practised and proven. The success of the process depends on a comprehensive level of integrated planning, coordination and management, and the unconditional commitment, participation and sharing of information by all parties."

6.5 This definition of AOR was also agreed to or accepted by AA, and was substantially identical to what ADSCOM saw as the requisite for airport opening.

6.6 In NAPCO's assessment report, NAPCO advised that continuing delays in the physical works and systems had had the effect of compressing the AOR period in relation to the opening date target, which at the time was April 1998. Given this programme compression, the AOR activities, including training and trials, would have to be conducted in parallel with works completion activities. The report pointed out that such overlapping of the construction works phase and the AOR phase was perhaps unprecedented when comparing AOR programmes for other new major airports. While such an approach was not necessarily unacceptable, a potential risk to AOR existed. To mitigate the risk to AOR and a smooth opening, NAPCO recommended that AA undertake a well-defined and programmed iterative process of AOR access, training and trials activities in parallel with works completion activities, starting six months from opening.

6.7 While AA planned to initiate its training programmes in Interface House and other off-site locations to get a necessary early start on training, NAPCO pointed out in the report that there was no substitute for on-site, hands-on training. To accommodate this, NAPCO recommended that the Airport Management Division ("AMD") be granted access to the Airport Operations Control Centre ("AOCC") facility and systems, as well as facilities and systems designated for use in the first trial, at least 18 weeks prior to opening in order to start hands-on operator training. NAPCO also recommended that business partners and Government staff be granted unimpeded access to facilities and systems designated for use in the first trial at least two weeks prior to the first trial date (at least 12 weeks prior to opening). NAPCO further recommended that all systems deemed essential for Day One operations be fully tested, commissioned and available for final operational training and trials not less than six weeks prior to opening. The recommendations were based on discussions between the NAPCO AOR Coordination Team and members of AMD, including W44 Mr Chern Heed, AMD Director, and reflected AMD's views at that time.

6.8 Other findings from NAPCO's AOR assessment report included:

(a) While it was found that AA's training plans appeared to be well developed, NAPCO was concerned that AA planned to proceed with training on systems that had not been fully developed, tested and commissioned. NAPCO considered it likely that AA staff had to be retrained on the actual Day One systems following their testing and commissioning, and that AA needed to take this into account in its training plans.

(b) Lack of integrated AOR plans and programmes, and no demonstrated ability to track the sequence of required AOR steps within AA's master programme. NAPCO found it difficult to determine the true status of constructions works as well as AOR activities in AA's master programme leading to Day One operations. There were a number of schedule and interface mis-matches in AA's programmes. Many of these mis-matches related to the use of mandatory dates that were not linked to other construction and AOR activities. NAPCO pointed out that without such linkage, progress measurement and the effects of delay could not be fully assessed, and that the ability to chart a critical path and develop plans to recover from potential delays was limited.

(c) Lack of coordination within AA itself, and between AA and its business partners and Government departments on AOR issues. NAPCO found that the matrix organisational split of AOR responsibilities between the various AA Divisions was not functioning efficiently, that information bottlenecks existed, and that there should be a shift in organizational focus and decision making from the construction side, ie PD, to the operations side of AA, AMD. NAPCO recommended that AA consider appointing a single-point responsible senior-level executive to direct the AOR process and coordinate action inclusive of all participants, including the various AA Divisions.

6.9 AA agreed with the major findings of NAPCO and addressed the concerns of NAPCO. On training, AA gave assurance that re-training would be undertaken as required. This was subsequently reconfirmed by AA in its reply of 10 December 1997 to a series of questions posed by W36 Mrs Anson CHAN, the Chief Secretary for Administration and Chairman of ADSCOM ("the Chief Secretary"). AA stated that necessary refresher training would be provided in a 10-week period from the final handover of Day One systems (then targeted at 15 February 1998) to the airport opening date (which was then late April 1998). On integration of the construction works with the AOR programme, during the course of NAPCO's assessment, AA had already given assurance that a programme integrating works and AOR activities was already in place, and would be further developed as necessary. As noted in ADSCOM Paper 34/97 dated 19 September 1997, AA agreed to produce an AOR master programme linked to its construction programme, called the Integrated Accelerated Programme. On coordination, AA gave assurance that steps would be taken to improve coordination and communication between PD and AMD. W43 Oakervee stated at the ADSCOM meeting on 20 September 1997 that a task force had been set up on the interface between PD and AMD. At the ADSCOM meeting on 13 October 1997, AA's Divisional Manager of Planning and Scheduling, Mr J Jesudason, stated that the relationship between the two Divisions was getting better every day. At that meeting, W3 Dr Henry Duane Townsend, the Chief Executive Officer ("CEO") of AA, was requested by the Chief Secretary to keep a close watch on the situation and to promptly sort out any difficulties between the Divisions. AA also assured ADSCOM that the AOR milestones tabled at the ADSCOM meeting on 20 September 1997, based on ADSCOM paper 34/97, would be met. At the ADSCOM meeting on 20 September 1997, W3 Townsend confirmed that AA agreed with NAPCO on what constituted critical dates in the training and trials programme, and he was positive that AA could achieve the milestones, including having integrated systems fully tested and commissioned not less than six weeks prior to opening.

Section 2 : Decision on AOD

6.10 The decision to open the airport on 6 July 1998 was taken by ADSCOM in January 1998. In her witness statement, the Chief Secretary as Chairman of ADSCOM recapitulated major events that illustrated how this decision was arrived at. The target date for the opening of the new airport was originally scheduled for April 1998 in the announcement made by the then Financial Secretary in June 1995 following the Sino-British agreement on the financing arrangements for the new airport and the Airport Railway ("AR"), which was later known as Airport Express. It was based on the Provisional Airport Authority's ("PAA") programme of works and the time required for commissioning, trial operations and planning the move from Kai Tak. Since then AA, Government departments and many other parties which were involved with the Airport Core Programme ("ACP") had been using the date as the target completion date of their own programmes. However, it was always understood that as a target date, it would require confirmation by a formal announcement to be made closer to the time by Government in conjunction with AA, in the light of the overall airport readiness achieved and the prospects of AR being ready ahead of time. AR had a planned completion date of 21 June 1998 but there was the expectation that, given the past record of Mass Transit Railway Corporation ("MTRC"), progress on AR could probably be accelerated to support airport opening in April 1998.

6.11 In the franchise agreements of Asia Airfreight Terminal Company Limited ("AAT") and Hong Kong Air Cargo Terminals Limited ("HACTL"), as well as in others, AA was obliged to give a three-month advance notice to the franchisees of the date of the opening of the new airport. While this obligation encumbered AA to have a date fixed for the opening long beforehand, it had to examine and monitor the progress of all kinds of works relating to the building, building services and facilities in order to keep to the expected opening in April 1998. On the other hand, ADSCOM was mindful of the importance to fix an airport opening date well in advance so that the public as well as all concerned parties would know this date for their own purposes and planning. It was therefore necessary for Government to take a decision on a firm airport opening date to be made at least three months ahead of April 1998.

6.12 With the above in mind, Government started to examine critically the state of overall AOR from February 1997 onwards. On supporting transport facilities, ADSCOM re-examined with MTRC prospects of AR being ready ahead of time and in parallel considered the feasibility and acceptability of bringing in contingency transport arrangements in the case of AR acceleration not being possible.

6.13 From May 1997, ADSCOM had been requesting AA to advise on the overall readiness of the airport to open in April 1998. In May and June 1997, W3 Townsend made the assessment that the physical structure of the Passenger Terminal Building ("PTB") should be completed in November 1997 and other elements such as the fit-outs, the computer systems and the retail and commercial operations should be in place by January or February 1998. He also advised that an AA Master Programme was in place to keep track of AOR by integrating franchisees' programmes, systems contracts and training.

6.14 ADSCOM looked seriously into the possibility of advancing the completion of AR. At the ADSCOM meeting of 6 September 1997, MTRC made a presentation to ADSCOM on progress of the AR when MTRC expressed reservations in its ability to advance AR completion date to April 1998. ADSCOM asked the Chairman of MTRC to put together a proposal setting out all relevant considerations such as practical, operational and financial implications.

6.15 At the ADSCOM meeting on 20 September 1997 referred to in paragraph 6.9 above, ADSCOM asked AA for an analysis of the critical issues and an unequivocal statement whether April was a realistic target date to enable ADSCOM to arrive at a definitive view on airport opening.

6.16 At the ADSCOM meeting on 13 October 1997, AA provided a more comprehensive report with a revised work programme and briefed ADSCOM on the works progress, training and trial preparations, and contingency plans. W3 Townsend also reported that he believed HACTL should be able to achieve 50% of its designed capacity by end April 1998. However, in spite of the general optimism expressed by AA, ADSCOM asked for further reports on training and trial, as well as on systems integration.

6.17 At the ADSCOM meeting on 24 October 1997, MTRC made a detailed presentation indicating fundamental problems with advancing AR completion date to April 1998. The Chief Secretary assured the

Chairman of MTRC that in no case would Government compromise the principle of safety and reliability. At the same meeting, ADSCOM considered a paper prepared by the Transport Bureau on the impact of a mismatch between the commissioning dates of the new airport and AR. While it was agreed that alternative contingency transport arrangements for April opening should be further explored, the prospects of a later opening date in late June or early July were also discussed and 1 July 1998 was raised as a possibility. The Chief Secretary asked for a careful analysis of all essential factors before a final decision was taken.

6.18 At the ADSCOM meeting on 3 November 1997, AA provided an updated assessment on AOR, addressing the key questions raised by ADSCOM, including construction programme, status of systems integration and scenario for Day One operation. AA was positive that an April 1998 opening date could be achieved. W3 Townsend reported that the AA Board was following the subject closely and that the consensus of the Board was that they would be able to operate the airport on 1 April 1998, but taking account of HACTL's progress, the end of April would be a more suitable date. AA's optimism at that time, however, was not entirely shared by ADSCOM members. From the NAPCO reports, it was noted that the works programmes had slipped, and the plan for systems training was tight. The Chief Secretary's view was that as the AA Board and its management were closest to the actual construction of the airport and its operational readiness, the AA Board must provide Government with a categorical confirmation that everything essential for an efficient airport on Day One would be available if they recommended an April 1998 date. At the same meeting, Transport Bureau presented a discussion paper on contingent transport arrangements. ADSCOM's general view was that the contingent arrangement, though technically feasible, might not be as efficient as AR and would not be commensurate with the image of a modern airport.

6.19 At a special meeting on 7 November 1997, ADSCOM remained concerned that AA had continued to qualify its statements with provisos. ADSCOM noted AA's apparent difficulty in keeping to milestones in its own programmes. The Chief Secretary decided to write to the Chairman of AA asking a series of specific questions based upon information provided by NAPCO. At her request, W1 Mr Richard Siegel, Director of Civil Aviation (" DCA"), attended this and subsequent ADSCOM meetings to provide additional input from the civil aviation perspective.

6.20 Accordingly, the Chief Secretary wrote to the Chairman of AA, W50 Mr WONG Po Yan, on 15 November 1997 expressing ADSCOM's serious concern as to whether April 1998 was a realistic opening date. In his reply dated 10 December 1997, W50 Wong responded to each and every question and assured her that

> "…the Board has undertaken a very thorough review of progress in all areas, with particular reference to areas of concern identified in your letter and the attached questions. Following this careful scrutiny, we are satisfied that the airport can be ready to open for safe, smooth and efficient operation on an appropriate date in the last week of April".

6.21 Notwithstanding these reassurances from AA, the Chief Secretary again wrote to W50 Wong on 17 December 1997 saying that Government members of the AA Board still had concern in various areas and that they had suggested that as a number of key milestones would be coming up in the next few weeks, both AA and Government would be in a better position to assess whether an April opening date would be achievable if these key milestones were indeed achieved according to the latest programme presented by the AA management. She urged the Board to continue to monitor developments closely with a view to reaching a firm conclusion on the airport opening date in early January 1998.

6.22 The crucial ADSCOM meeting took place on 2 January 1998. There were different opinions amongst members and regular attendees of ADSCOM. The implications of an April or June 1998 opening were carefully examined. After a thorough discussion, the Chief Secretary eventually decided, with the endorsement of the entire ADSCOM, that given the doubts on the adequacy of contingency transport arrangements and the state of readiness of airport systems and HACTL, airport opening should be deferred, with the aim of producing on Day One a world class airport supported by efficient transport facilities.

6.23 Bearing in mind the repeated positive assurances from AA that the new airport would be fully operational in April 1998, it was thought by ADSCOM members that an extra three months would provide added comfort to both AA and its franchisees to strive for a safe, secure and efficient airport upon its opening.

6.24 Having ruled out the April date, the Chief Secretary asked those present in the meeting if 21 June 1998 (which was the scheduled date for AR commissioning) or 1 July 1998 (which was the first anniversary of the Hong Kong Special Administrative Region) should be the new opening date. The general inclination of ADSCOM members was for 1 July 1998, to allow more time for AR to get ready and for public relations reasons.

6.25 Recognising that there should be a time gap between the ceremonial opening of the airport and its actual coming into service, the Chief Secretary requested NAPCO to find out what the shortest gap should be, taking into account the logistical requirement for the airport relocation exercise and the airport opening ceremony.

6.26 At a special meeting on 8 January 1998, NAPCO suggested and ADSCOM accepted Monday 6 July 1998, because a few days would be needed between the airport ceremonial and operational opening for the critical phase of the airport relocation exercise. Opening the new airport on a Monday would offer the advantage of the night move taking place when road traffic was light and when a big spectator turnout would be unlikely. Air traffic was also lighter on a Monday.

6.27 The Chief Secretary then met the Chief Executive in Council ("the Chief Executive") and explained to him the reasons why ADSCOM had decided to defer the opening date to July. He endorsed the decision and agreed that the Executive Council ("ExCo") should be informed of ADSCOM's recommendation. Airport opening was discussed in ExCo on 13 January 1998, and ADSCOM's recommendation was noted.

6.28 The 1 July date was eventually altered to 2 July 1998 for the ceremonial opening of the new airport, while the day for opening the new airport for operation was unaltered to remain as 6 July 1998.

Section 3 : Preparation for AOD

6.29 Prior to the announcement of AOD, both AA and Government appreciated that there were slippages regarding the construction, fit-out and system works in PTB and in HACTL's premises.

6.30 HACTL's premises consist of SuperTerminal 1 ("ST1") and an Express Centre, but the major part of the cargo handling operation would be performed within ST1. Construction of ST1 suffered from a series of late completion dates, with building works delays affecting equipment installation, commissioning, testing and the installation and testing of Government department support systems. However, NAPCO was not aware of any reports of problems with HACTL's own computer system development. Within ST1, HACTL was to provide a designated number of rooms for Government departments, the services of which were essential to the air cargo business. These departments, particularly the Customs and Excise Department ("C&ED"), were in turn dependent on their own operating systems, such the Air Cargo Clearance System, Trunk Mobile Radio ("TMR") system, Information Network, etc. These systems were installed by direct Government contracts, entrustments to HACTL contractors and entrustments to AA contractors. For the last few months before the July opening, NAPCO's primary concerns merely related to the installation of Government's systems and HACTL's ability to satisfy the requirements for obtaining an occupation permit. By AOD, the ability of the Government departments to support the air cargo operation at HACTL had been achieved, and no problems arose therefrom. In the circumstances, the rest of this report will not deal with the Government entrusted works in ST1.

6.31 NAPCO did not directly monitor HACTL's development apart from the Government entrusted works. The reasons for the positions of Government and AA relating to HACTL can be found in paragraphs 5.64 and 5.65 of Chapter 5.

6.32 The routine monitoring carried out by NAPCO in relation to HACTL was initially focused on the basis of HACTL's Monthly Reports to AA, copies of which AA passed to NAPCO. Later on, AA also provided NAPCO with copies of AA's own internal project reports, which contained very detailed information on both PTB and HACTL projects. NAPCO staff were also allowed to participate in meetings between AA and HACTL.

6.33 ST1's piling and building contracts started in September and November 1995 respectively and by August 1996 delays of around two months in the building works started to impact the erection of the cargo handling equipment. By November 1996, these equipment delays had increased to three months and HACTL acknowledged that it would have to control progress very closely.

6.34 It was stated in NAPCO's Weekly Situation Report dated 2 May 1997 that broad agreement had been reached in principle with its main building contractor, Gammon Paul Y Joint Venture ("GPY") on a revised programme which would address delays of around 20 weeks and achieve 50% of its full capacity throughput in April 1998. Yet no agreement incorporating any accelerated programme was signed.

6.35 The delays suffered in HACTL's construction works caused great concern to NAPCO and ADSCOM, and the subject was discussed continuously since the middle of 1997. Mr Tudor Walters, Consultant Project Manager ("CPM") of NAPCO, provided an account in his statement as follows:

(a) By the ADSCOM meeting on 12 July 1997, HACTL's senior management had made public statements to the effect that they doubted their ability to support an April airport opening.

(b) By the ADSCOM meeting on 20 September 1997, W3 Townsend confirmed that HACTL was striving to meet an end April 1998 opening.

(c) At the ADSCOM meeting on 8 December 1997, lack of confidence in HACTL's ability to meet an April 1998 opening without a major acceleration to its existing contracts was noted.

(d) At the ADSCOM meeting on 14 February 1998, even though the airport opening date had by then been postponed to July, HACTL remained high on the agenda of outstanding concerns. Acceleration measures had not yet been contractually concluded with GPY.

(e) By 21 March 1998, a supplemental agreement for acceleration had been negotiated between HACTL and GPY, but it was not until a month later that the parties formally signed it.

(f) By the ADSCOM meeting on 22 May 1998, the main concern was with the time when an Occupation Permit for ST1 could be obtained. NAPCO had written directly to W7 Mr Anthony Crowley Charter, the Managing Director of HACTL, on 21 May expressing concerns over progress, but had received a response at the end of the month expressing confidence in ST1 being ready in time. The detailed Monthly Reports from HACTL at this time were conveying improvements which would support a 75 percent throughput by airport opening.

(g) By 6 June 1998, HACTL's target for the Occupation Permit had slipped to 20 June 1998.

(h) HACTL was part of the itinerary for the ADSCOM visit to the new airport on 14 June 1998. The lack of readiness of offices within the building for Government departments was noted, but W7 Charter expressed confidence and offered unqualified assurance that 75% throughput capacity would be achieved by AOD.

6.36 The problems with the PTB may be generalised as predominantly caused by lateness of first the phased completion of the foundations, then late completion of the building structure, finishes, systems installation, integration, testing and commissioning, with training and familiarisation being squeezed into a continually decreasing time frame.

6.37 Efforts were made by the AA management to address the initial lateness in the building works by effecting two supplemental agreements in September 1996 with the main building and building services contractors. The purpose of these supplemental agreements was to address accumulated delays and introduce accelerations while at the same time extending the completion dates for these contracts from the end of June 1997 to the end of October and November 1997 respectively. This would have preserved four clear months for training trials and familiarisation ahead of a 1 April 1998 opening.

6.38 The contractors for the AA systems were also subsequently approached for proposals to recover delays and accelerate the completion of their works by December 1997. Most systems contractors refused (or were unable) to guarantee completion by the requested date, but offered phased completion on a prioritised basis to December 1997, with certain items of system functionality deferred to and after airport opening. At the time, this was conveyed by AA to be acceptable as all system functions necessary for airport opening would be in place, although training and familiarisation would have to be phased to match systems availability. Specific shortcomings persisted in a number of the airport operating systems, however, particularly the Flight Information Display System ("FIDS") and its integration with the Airport Operational Database ("AODB") on which many other airport operating systems relied for their basic information.

6.39 At the ADSCOM meeting on 8 December 1997, it was noted that the AOCC facility, agreed by all at the 20 September meeting to be so crucial in its hand-over to AMD on 15 November 1997, was anticipated for hand-over on 5 January 1998. Similar slippage had taken place on Government areas within PTB. None of the Government areas had been completed by 1 December 1997, and the best estimate by AA was for completion in March 1998.

6.40 Following the announcement of 6 July 1998 as the AOD, a lot of preparations in various areas were made in earnest by AA for AOR. AA took steps to ensure that all AMD staff who would be working at the new airport received adequate operational training for the roles which they would perform at Chek Lap Kok ("CLK"). A large number of the staff worked at Kai Tak, and would continue to work there until AOD. There were further staff who were due to work at CLK but did not work at Kai Tak. It was necessary to ensure that all staff received experience of the operational environment at CLK before AOD. The new staff all undertook training at Kai Tak in order to gain real life operational experience. This facilitated the release of existing Kai Tak staff to undergo training and familarise themselves with CLK operations. The new CLK staff also attended operational training courses at CLK, which included both classroom sessions and hands on sessions in which they were able to gain experience of the systems and facilities at CLK.

6.41 In addition, the AOCC staff also took part in the testing and commissioning of systems organised by PD and the Information Technology ("IT") Department and thus acquired familiarity with operational procedures and the fall-back and workaround systems which would be required if the primary systems or facilities did not function as designed. To reinforce what had been learned from the various training courses, all the terminal operations staff were scheduled to participate in at least one of the five terminal operation trials and other relevant tests so that they could benefit from the experience of working in a simulated terminal operations environment.

6.42 Airport operational trials were an essential element of AOR Programmes. The organisation, consultation and management of these trials required a long lead-time for planning which was started in late 1996. AA had programmes for the airport trials to be conducted between January and March 1998, before the airport became operational at the then targeted April 1998 opening. The objectives were to identify deficiencies in the facilities, and to test the effectiveness of the operational training received by staff. Another purpose of the trials was to identify potential problems before AOD so as to make improvements to minimise the problems which might arise when the airport became operational. These objectives were reflected in the initial paper on airport trials which was circulated on 8 November 1996 to, among others, all general managers in AMD.

6.43 The scenarios for the trials were carefully planned in consultation with all parties concerned. This included the airlines, ramp handling operators, the baggage handling operator, relevant Government agencies, and HACTL and AAT in case of airside trials. AA began consultation with business partners and Government departments with a view to establishing their requirements for the trials in early 1997. After this initial consultation process a strategy paper was prepared incorporating the comments of the business partners and Government agencies. A working group was also formed to discuss and agree on trial scenarios and the way to carry them out in the trials. The working group, including business partners and Government agencies, held its first meeting on 11 April 1997 and continued to meet up to the time of the final airport trial.

6.44 The trials were designed to simulate real operation as much as possible. However, as AA was not able to get many aircraft from the airlines to participate in the trials, it was impossible to simulate the stress of real operation.

6.45 AA originally planned only three trials of landside and PTB facilities and systems, for mid-January, mid-February and mid-March 1998. As AOD was moved from the expected April to July 1998, AA reviewed the strategy for the trials and decided to add two additional trials. The organisation of the operational trials was a major logistical undertaking. The scale of the AA trials increased each time. The first airport trial on 18 January 1998 involved only approximately 500 participants; the second on 15 February 1998 had approximately 1,000 participants; the third on 28 March 1998 comprised approximately 1,200 participants; the fourth on 2 May 1998 had approximately 2,000 participants; and the fifth trial on 14 June 1998 involved 12,000 participants. However, because the construction project was operating to a very tight timetable, the possible scenarios had to be matched up with the facilities that would be available at the date of the trials.

6.46 Although it was always planned that AA would organise and manage a series of operational trials, with progressive integration of the landside, airside and PTB operations, these were not the only trials which would be undertaken by airport users before AOD. Other trials would be undertaken by contractors, which were monitored by AA, in relation to particular systems and facilities. Further, it was always the case that other airport users, such as the business partners and Government agencies would organise their own trials and training for their staff. Indeed AA actively encouraged them to do so. These trials did not have to involve AA but it would always be prepared to help if required.

6.47 After each trial there were review meetings, attended by a number of AA staff and representatives from NAPCO, Government departments such as the Fire Services Department, Immigration Department, C&ED and Hong Kong Police, as well as business partners like Cathay Pacific Airways Limited, Hong Kong Airport Services Ltd. and Jardine Air Terminal Services Ltd., HACTL, etc.

6.48 After these meetings, participants in the trials would prepare reports focusing on areas for improvement in accordance with the objectives of the trials. These would then be collated in a summary. In addition, AA undertook surveys with the volunteers who played the role of passengers in the trials in which it sought views on matters such as signage, cleanliness, lighting and temperature within the PTB, and also asked them to make comments on any other matters on which they wished to express a view. The summaries prepared following the review of meetings of the trials were sent to W44 Heed. He would discuss the matters arising from the reports with the Deputy Chief Executive Officer of AA, W48 Lam, and W43 Oakervee. Their collective views were then incorporated in reports to the AA Board which discussed the results of the trials and issued recommendations for future action with a view to remedying defects discovered in the trials.

6.49 As a result of these actions, a number of problems were identified and changes and improvements accordingly made by AA to PTB facilities or procedures. For instance, after the first trial, the feedback showed that the queuing area for Immigration was too short. AA therefore moved the screens back to allow a longer queuing area. There were also comments that the toilet facilities were insufficient in the Meeters and Greeters Hall and as a result two additional bigger toilets were built inside the hall. In addition, other improvements such as modifications to the toilets, revision and addition of direction signs were suggested. However, AA was not able to have all of these changes implemented before AOD.

6.50 NAPCO was closely monitoring the airport trials as observers. NAPCO reported its observations with critical comments to ADSCOM. In the Weekly Situation Report for 24 January 1998, NAPCO commented that the first trial served to demonstrate that incomplete systems remained the greatest risk to AOR. Although the trial was a useful familiarisation exercise for the participants, the original trial objectives had not been achieved. FIDS crashed and both FIDS and the interface between FIDS and Common User Terminal Equipment ("CUTE") were inoperable; the terminal-wide Public Address System ("PA") did not function; signage was minimal and inadequate; close circuit television was not yet set up for Government departments; the telephone and TMR systems were only available on a limited and restricted basis. The required operational and support facilities for both the Government and business partners were only partially available. Five of the seven originally planned incident trials, involving the airport systems such as communicating a gate change via FIDS, had to be cancelled. It was subsequently discovered by AA that the crash of FIDS was caused by Societe Internationale de Telecommunications Aeronautiques incorrectly loading the software for CUTE and that the problem was eventually resolved.

6.51 At the ADSCOM meeting on 14 February 1998, AA reported further slippage in FIDS, with the site acceptance test ("SAT") again delayed from 15 February to 25 March 1998. That latter date essentially became the date for finally deciding whether FIDS should be an integrated system or should be in stand-alone mode.

6.52 In the Weekly Situation Report for 21 February 1998, NAPCO emphasised that the second trial showed that the greatest risk to airport operational readiness was systems development, integration, testing, commissioning and training. The airport systems had yet to achieve a state of pre-operational functionality and significant problems continued with the stability of various systems, and in particular FIDS. The Day One version of FIDS, scheduled to be in place by the second trial on 15 February 1998, some 20 weeks ahead of opening in order to provide a platform for system integration as well as training and trials, had slipped to late March 1998. At the second trial, FIDS crashed again during the initial check-in process, and both FIDS and the FIDS/CUTE interface were only available with limited functionality on an intermittent basis at the trial. As with the first trial, given that required operational facilities and systems were only minimally and partially available, the second trial was more an extension of the familiarisation programme rather than a meaningful "real life" operational trial.

6.53 During late February, as noted in NAPCO's Weekly Situation Report for 28 February 1998, the follow-on trial dates were confirmed for 2 May and 14 June 1998, the latter to be a fully integrated dress rehearsal prior to AOD. The airside trial originally scheduled for 24 February was cancelled, and airside trial elements were combined with the landside/PTB trial scheduled for 2 May 1998. In the Weekly Situation Report for 7 March 1998, NAPCO noted that the Day One version of FIDS, inclusive of basic functionality as well as required systems interfaces, had slipped further, from 15 February 1998 to 1 May 1998.

6.54 In order not to interfere with FIDS development and testing activities, the landside/PTB trial originally scheduled for mid-March was re-scheduled for 28 March 1998. However, in the Weekly Situation Report for 14 March 1998, NAPCO noted that given continuing FIDS problems, further training by airline staff on FIDS/CUTE stations and check-in procedures had been postponed to mid-April 1998, which did not support the objective of having a functional system and sufficiently trained staff for a meaningful trial on 28 March 1998. To help alleviate this situation somewhat, and provide a more "real-life" simulated setting for FIDS testing, AA scheduled and conducted a number of pre-trial exercises with staff from 13 airlines on 25 March 1998. In this pre-trial exercise, the FIDS/CUTE interface appeared to be functional and stable, although a number of airlines experienced problems logging on and off of the system, and a number of blank FIDS monitors was noted.

6.55 At the ADSCOM meeting on 21 March 1998, AA reported that the SAT of FIDS functionality on a limited number of monitors (on a localised network) had achieved a 90 percent pass rate. However, interfacing problems with AODB, the Baggage Handling System ("BHS") and CUTE persisted. At ADSCOM's insistence, the AA Board had instructed the development of a standby FIDS. There was concern that the Day One systems configuration including any standby and contingency arrangements should be in place by the first week of May, so as to leave two clear months for final training and familiarisation.

6.56 The NAPCO observation team also attended the third trial on 28 March 1998. In its Weekly Situation Report for 4 April, NAPCO stated that this trial was generally successful for those systems functions that were made available, although some facilities and most systems required by the Government departments remained unavailable. The report also noted that FIDS testing was on-going although some problems remained. The report expressed the urgent need for AA to identify the system functionalities critical to support airport opening in order to achieve a state of pre-operational functionality.

6.57 On 30 March 1998, NAPCO staff with the personnel from International Bechtel Company Ltd ("Bechtel"), a US firm of airport consultants, held an internal review of AA systems status, including contingency measures, based on drafts of ADSCOM Papers 14/98 and 16/98 that AA was to present to ADSCOM on 1 April 1998 on the status of FIDS. Following the concern expressed by ADSCOM members over FIDS and their urges to have a standby FIDS developed, the AA Board approved the development of a standby FIDS on 23 March 1998. A standby system is a fallback and will be used when the main system fails to function. In the final version of AA's ADSCOM Paper 14/98, dated 1 April 1998, AA stated its intention to proceed with the permanent FIDS, which it reported as having now been sufficiently developed to provide an operational system which could be satisfactorily operated by AA's AMD staff and the airlines. However, AA reported that it was also proceeding with the development and implementation of a standby FIDS that would be available in case the permanent system failed. While NAPCO questioned whether there was sufficient time to successfully develop and commission such a standby FIDS prior to opening, as stated in its ADSCOM Paper 14/98, AA showed that they planned to complete development and testing of standby FIDS functions by 15 June 1998 and to test the switch-over or cut-over from the permanent FIDS and to train operators from that point to 30 June 1998. NAPCO was also concerned about the additional equipment, revised operational procedures and staff training that would be required for implementing such a standby system. In a letter faxed by Mr Tudor Walters to W3 Townsend, Mr Walters expressed the need, in regard to the standby FIDS, for AA to develop a quantification of essential data transfer requirements, workstation and other equipment needs, software modification requirements, staff requirements, procedure modifications and a programme to bring together all these elements.

6.58 In the Weekly Situation Report for 18 April 1998, NAPCO reported that many critical FIDS software problems remained, and they needed to be resolved before the end of April in order to establish the Day One operational software. The report also noted that AA was proceeding to develop its contingency strategy for FIDS, including manual data transfer that would be required if resort had to be made to use the standby FIDS. On the other hand, at the ADSCOM meeting on 18 April, the level of confidence being reported by AA in relation to systems readiness and integration was markedly increased.

6.59 In the Weekly Situation Report for 25 April 1998, NAPCO noted that AA had identified the system functionalities critical to support airport opening, which were reported to ADSCOM on 18 April 1998. AA proposed that Day One systems operation would be to a large degree on stand-alone mode. A stand-alone mode means that the system in that mode operates independently and not in a mode integrated with other systems. When a stand-alone mode is used, its integration with other systems will be required to be done manually, by operators inputting the required information and data derived from the stand-alone into the other systems. NAPCO again expressed the urgent requirement that AA provide a quantification of the manual data transfer across system interfaces so that the amount of resources and procedural changes could be identified and implemented. It noted in the Weekly Situation Reports for both 25 April and 2 May 1998 that the airport systems would not achieve a state of pre-operational functionality before mid-May 1998, and that this remained a risk to AOR.

6.60 On 2 May 1998, the NAPCO observation team attended the fourth trial. In the Weekly Situation Report for 9 May, NAPCO noted that the trial was generally successful for those systems functions that were made available, although some facilities and most systems required by the Government departments still remained unavailable. This trial encompassed expanded landside/PTB elements, and included a number of airside trial scenarios using a B-747 aircraft. In the PTB portion of the trial, a number of continuing system faults and failures were reported.

6.61 In its Weekly Situation Reports for 9 and 16 May 1998, NAPCO reported that a number of FIDS software issues which AA's AMD considered critical remained outstanding. There was an internal NAPCO review of AA's Systems Availability Checklist, which identified those systems that were crucial for AOR and identified the integration status of each system. NAPCO also wrote to W45 Mr Kironmoy Chatterjee, the Head of IT Department of AA, to point out its understanding that problems continued with FIDS, that parts of PA were still not available and that 30 percent of the telephone circuits were not functioning.

6.62 In the Weekly Situation Report for 23 May, NAPCO reported that little overall progress had been achieved by AA in rectification of the remaining FIDS software problems. NAPCO noted that the airport systems would not achieve a state of Day One operational stability before early June 1998, and that this represented a risk to a smooth opening. However, AA continued to develop contingency measures and had conducted a successful demonstration of the standby FIDS on 22 May 1998, which was reported in NAPCO's Weekly Situation Report for 29 May 1998. At the ADSCOM meeting on 22 May 1998, in response to a direct question from the Chief Secretary, W43 Oakervee gave specific assurance that the airport would be ready to open on 14 June 1998, the date of the fifth and final trial, also termed the dress rehearsal. AA continued to give assurance that all critical software problems had been resolved on the primary FIDS. According to W32 Mr Jhan Schmitz, the then Deputy CPM of NAPCO, on 29 May 1998 AA reported that FIDS had been tested at 120 percent of its design capacity with no major problems.

6.63 At the ADSCOM meeting on 6 June 1998, AA reported that the main airport operating systems were finally commencing reliability testing in integrated mode. W3 Townsend also reported that the Access Control System ("ACS") had been successfully tested.

6.64 The fifth and final trial took place on 14 June 1998, and NAPCO's observation team again attended. In the weekly Situation Report for 20 June, NAPCO stated that a number of systems problems had been observed. NAPCO noted that the Day One configuration of airport systems, including manual modes, were now to be in place by the week of 22 June 1998, and that there were continued systems delays and operational problems. NAPCO also observed that the results of the trial were somewhat inconclusive, that many FIDS displays were not working, that baggage from the check-in areas seemed not to be arriving at the lower parts of the baggage system, that departure gates in the South Concourse could not be operated properly, possibly due to problems with ACS, and that TMR was suffering from interference. These and other observations served as background for a note NAPCO prepared for tabling at the ADSCOM meeting on 24 June 1998. Although the five trials were conducted on the basis of what the facilities would permit at the time, slippage in construction and installation of equipment and systems restricted the scope and value of the trials. Even though the fifth trial, the final one, involved 12,000 participants, there was no true airport-wide trial to test how the various systems, including cargo handling, would interact and function together. As W51 Mr Jason G YUEN, one of the experts appointed by the Commission pointed out in his report, AA did not plan properly for any major failures that might show up at the final airport trial. The last trial was only three weeks from AOD which hardly allowed sufficient time for recovery, retrial, training and practice should any major system fail.

6.65 On 14 June 1998, ADSCOM members visited the new Airport by way of AR. Assurances were given by the senior AA management to the Financial Secretary who was acting as Chairman of ADSCOM that within PTB all outstanding electrical and mechanical systems works would be complete by 17 June in Government rooms and that in AOCC, the standby FIDS and gate allocation systems were ready, and all cabling would be complete by 17 June.

6.66 Between 22 and 24 June 1998, NAPCO and Bechtel staff conducted an internal review of ADSCOM Paper 34/98 entitled Airport Operational Readiness Status Report prepared by AA for presentation to ADSCOM on 24 June 1998. In that report, AA stated that reliability tests on FIDS version 2.01C commenced on 14 June and were completed on 20 June using live data from Kai Tak through AODB, that "the reliability of the system as a whole has been 98.7% available", and that the reasons for unavailability of some monitors and liquid crystal display ("LCD") boards at the 14 June trial had been identified and the problems were being rectified. In ADSCOM Chairman's brief of 24/6/98 prepared by NAPCO, NAPCO stated "We suspect that the FIDS problems have not been fully resolved. The 98.7% reliability of the system is not satisfactory." In a note prepared for ADSCOM, which was tabled at the ADSCOM meeting on 24 June 1998, NAPCO pointed out that while the permanent FIDS had completed a 5-day test with satisfactory results, the system remained unstable, and that there were outstanding cable problems and connections affecting FIDS monitors and LCD boards at remote locations. NAPCO also noted that the standby FIDS was reported as being ready, and that the cut-over time from the permanent FIDS to the standby system was in the range of 45 minutes. NAPCO further reported that ACS was still unreliable. However, in the said ADSCOM Paper 34/98, AA gave categorical assurance that airport systems, including FIDS, would be operationally ready in time for airport opening on 6 July 1998. AA also indicated that testing had confirmed the stability of the permanent FIDS. It recommended that the permanent FIDS rather than the standby FIDS be used on AOD, and stated that in the event of the failure of some FIDS functions, planned workarounds could be depended on. AA also gave firm assurance that ACS software problems had been resolved and the remote control of door locks was being progressively implemented.

6.67 ADSCOM members revisited the airport on 24 June 1998. Again, firm assurances were delivered by the AA management that all essential outstanding works would be completed before airport opening.

6.68 In the Weekly Situation Report for 27 June 1998, NAPCO noted that the outstanding number of FIDS software problems had increased, including high priority items. Reliability tests continued, but

FIDS performance still showed problems of instability, with significant outages and downtime. It also expressed concern that a real risk to a smooth opening existed. However, AA continued to focus on contingency measures, and the cabling for the standby FIDS, which had been delayed, had now been completed and a reliability test had been conducted on 24 June 1998. Testing of the standby FIDS was to have re-commenced by 15 June 1998, following the system demonstration held on 22 May 1998 and initial testing, but priority work had been focused on the permanent FIDS. A final trial of the standby FIDS was subsequently conducted on 30 June 1998, as originally scheduled by AA in its 1 April 1998 presentation to ADSCOM, with representatives of 35 airlines in attendance. The success of this trial was confirmed by AA in its ADSCOM Paper 36/98 dated 4 July 1998.

6.69 The occupation permit for PTB was issued on 29 June 1998. Also on the same day, the Aerodrome License, effective from 1 July 1998, was approved by DCA, W1 Siegel, certifying from an aviation perspective that the new airport was in a sufficient state to operate safely and securely. NAPCO prepared an updated assessment of the current progress of critical airport works items having a potential impact on AOR as at 30 June 1998 which was subsequently tabled at the ADSCOM meeting on 4 July 1998. In the assessment NAPCO reported that its information on FIDS was that the system was down for 9% of the time during the continuous test run between 14 and 27 June 1998, and that was not satisfactory, noting that the overall FIDS remained unstable, and that ACS in PTB was unreliable. NAPCO further noted that AA was not giving priority to the standby FIDS. However, as late as 4 July 1998, AA continued to give firm assurance that any residual systems problems had been or would be resolved, and that the systems would be in a fully operational state, with standby contingency measures in place as required, prior to AOD. In its ADSCOM Paper 36/98, AA confirmed that the permanent FIDS was sufficiently stable, and that it would be used to provide the primary flight display function in PTB. It further stated that when some displays or functions failed, available workarounds could be depended on, and that immediate cut-over to the standby system, which had been satisfactorily trialed on 30 June 1998, could be made if the permanent FIDS failed. AA also stated its plan for using the standby Stand Allocation System ("SAS") for gate allocation, a function that could, if FIDS was absolutely reliable, be performed by Terminal Management System ("TMS") as part of the permanent FIDS . AA planned to use the standby SAS with parallel input into TMS to ensure that terminal operations were up to date. Insofar as the Building Systems Integration ("BSI") package system which included critical systems such as PA had not yet been fully commissioned, AA planned to use those systems in a standalone mode. As to ACS, AA stated that system stability had improved and that the system was now on line, with work continuing on improving the reliability of card readers.

6.70 From NAPCO's observations on site, (conveyed to ADSCOM via the NAPCO update as of 30 June 1998) NAPCO was aware that the permanent FIDS servers (two of them, one backing up the other) had experienced outages during the extended trial, which if repeated in operation could result in a down time of around 10 percent for FIDS. This was likely to occur intermittently resulting in a freezing of displayed information for the period when both servers were down. In NAPCO's view, this might create a nuisance. At the ADSCOM meeting on 4 July 1998, W45 Chatterjee, the Head of IT Department of AA, gave the following assurances. He reported that the permanent FIDS had been running continuously since 22 June and was stable. There would be workarounds when a function of FIDS went down and the workarounds had been tested and found to work well. The switch over from permanent system to the standby FIDS had been tested with 35 airlines. Within 30 minutes, most displays were switched on. He confirmed that that was acceptable from the operational point of view. During the switchover, the information displayed on the LCD boards and monitors would become outdated, but PA could be used to disseminate up-to-date information as a remedy. Whiteboards and extra hands would also be available to help with directing the passengers in the problem area when necessary.

6.71 Despite AA's assurances, W32 Schmitz, in his witness statement to the Commission, stated that he was concerned that a smooth opening of the new airport might be at risk. He anticipated that there would be some initial operations problems, disruptions and inefficiencies at the new airport, particularly in regard to airport systems and coordination between the various operators. However, given the continued assurances of AA management and staff that potential operational problems had been catered for and that contingency measures, procedures and resources were in place to recover from systems failures, he was led to believe that most of the problems would be manageable and would not unduly impact passenger or aircraft processing. He did not anticipate the severity or compounding of problems as they actually occurred.

6.72 W32 Schmitz also stated that his concern was not shared by AA. He knew of no member of AA's management or operations staff who expressed doubts as to whether the airport opening would in the end be operationally successful. AA had made known that the airport would not be 100 percent physically complete at opening, that construction, rectification and fit-out works would be on-going in PTB and the Ground Transportation Centre after opening, and that a number of systems functions and systems integration steps not considered AOR critical had been deferred. Yet, while AA anticipated that a number of "teething" problems could be expected, it maintained a consensus of confidence. On the basis of the assurances provided by the AA management who were closer to the situation and had the full picture, that at least the basic facilities, systems contingency measures were in place for the commencement of Day One passenger and aircraft processing, W32 Schmitz did not feel that any suggestion of postponement of the airport opening date could be justified. He maintained the same view when he testified before the Commission.

6.73 Mr Tudor Walters wrote to the Commission regarding the discrepancy between the "98.7% reliability" and the "9% downtime" of FIDS referred to in paragraphs 6.66 and 6.69 respectively above. He said that he did not consider the discrepancy as important, for he was of the view that the downtime of FIDS would only cause a nuisance since there were two host servers, one acting as a fallback for the other. He pointed out that W45 Chatterjee stated at the ADSCOM meeting on 4 July 1998 that the permanent FIDS had been running continuously since 22 June and was stable, and that switch-over from permanent to standby FIDS had been tested with 35 airlines and was successful. He relied on AA's assurance that FIDS was stable and that the standby FIDS and contingency measures were fully available in case of FIDS failing. He felt therefore that any intermittent outage of the permanent FIDS would have a nuisance value, but would not be catastrophic, and he did not believe it was necessary to specifically clarify the discrepancy. He was in fact rather optimistic towards the end and did not raise any real problems in the last ADSCOM meeting before AOD.

6.74 All the ADSCOM members with whom the Commission inquired about AA's statement that the "reliability of the system as a whole had been 98.7% available", namely, the Chief Secretary, the Financial Secretary, the Secretary for Economic Services and the Secretary for Works, answered that they understood that to mean that the whole of FIDS was 98.7% reliable. Had they known that the figure only related to the availability of the hardware of FIDS and not the reliability of the system as a whole, they would have asked the AA management at the ADSCOM meeting of 4 July 1998 to explain the significance of the figure regarding the overall reliability and stability of FIDS. Some of them further stated that they would also have inquired as to the reliability and stability of the standby FIDS. When the Chief Secretary testified before the Commission, she said that she was not too concerned with the discrepancy between the FIDS figures reported by AA and NAPCO, since she was confident that in case of FIDS failure, resort could be made to the standby FIDS which AA had reported to have been successfully tested on 30 June 1998. She knew that FIDS was not quite reliable but she had AA's confirmation that FIDS had been running continuously since 22 June. While she expected some teething problems, she was led to believe that there would not be any significant problems on AOD.

Section 4 : Responsibility

6.75 Having examined all the evidence very carefully, the Commissioners find it clear beyond peradventure that the Chief Executive was not involved in any way in the decision making of the opening of the airport, although he approved that decision. The decision was taken by ADSCOM which was then reported to him by the Chief Secretary and also reported to ExCo at its meeting on 13 January 1998. In the documents disclosed by ExCo to the Commission, there was a note of the meeting dealing with airport opening and it was to the effect that the airport opening date was noted by ExCo. Apart from that, there was a discussion on the ceremonial opening of the new airport on 1 July 1998. The date was eventually altered to 2 July 1998 in order to prevent any clash of the AOD ceremony with the activities anticipated for commemorating the first anniversary of Hong Kong's reunification with the Mainland. The Commissioners therefore conclude that the role of the Chief Executive was merely approving the decision and is not responsible in any way for it.

6.76 The position of ADSCOM is now examined. The Chief Secretary testified that the policy of deciding on AOR was to have the new airport operating safely, securely, efficiently and smoothly. ADSCOM had never resiled from those criteria throughout the course of its examination of the readiness of the new airport to open on AOD, from the time before the decision was made right up to AOD.

6.77 AA awarded a great number of contracts for the construction of various buildings and provision of various services and facilities to the new airport. Most of the contracts had their completion dates by the end of 1997, so that the aim of having the new airport operational in April 1998 could be achieved. In regard to HACTL's franchise for cargo handling, however, the date of operational readiness was agreed to be beyond April 1998, ie, 18 August 1998.

6.78 As stated before, in the franchise agreements of AAT and HACTL, as well as in others, AA was obliged to give a three-month advance notice to the franchisees of the date of the opening of the new airport. While this obligation encumbered AA to have a date fixed for the opening long beforehand, it had to examine and monitor the progress of all kinds of works relating to the building, building services and facilities in order to keep up to the expected opening in April 1998. On the other hand, ADSCOM was mindful of the importance to fix an airport opening date well in advance so that the public as well as all concerned parties would know this date for their own purposes and planning.

6.79 As from the middle of 1997, whereas AA established a Steering Committee on AOR to deal with issues relating to AOR, ADSCOM also started discussions in earnest on AOR issues. In the papers for discussion at the meeting of ADSCOM on 3 November 1997 (ADSCOM Papers 44/97 of 31/10/97 and 45/97 of 31/10/97), NAPCO reported to ADSCOM the progress of various works, facilities and services essential for the operation of the new airport. A number of matters of concern were raised and considered at that meeting and a subsequent ADSCOM meeting on 7 November 1997. Members of AA's senior management were invited to attend the meeting on 3 November 1997. On the training courses planned to be provided to AA's AMD staff, Government and business partners, W44 Heed assured ADSCOM that all staff would be trained in time, ie, by April 1998, and he was satisfied that the required equipment would be made available for training purposes. W46 Mrs Elizabeth Margaret Bosher confirmed that the priority items essential for airport operation would be available for the airport trials. In respect of the concern expressed by Mr Tudor Walters about the readiness of the systems at PTB, while W43 Oakervee acknowledged that there were some problems with the BSI (which was considered not critical for AOD), FIDS and BHS were on target. W3 Townsend also informed the meeting that the consensus of the AA Board was that AA was able to operate the new airport in early April 1998 insofar as AA works were concerned, but given HACTL's progress, the end of April would be a more suitable opening date.

6.80 The ADSCOM meetings on 3 and 7 November 1997 culminated in the Chief Secretary, as the Chairman of ADSCOM, sending a letter dated 15 November 1997 to the Chairman of the AA Board, W50 Wong. W50 Wong by letter of 10 December 1997 replied, dealing in length with the items raised in the Chief Secretary's letter.

6.81 In order to simplify matters, it is only necessary to mention the three issues which gave rise to the utmost concern of ADSCOM at the time, namely, the availability of FIDS to the new airport, the progress of the works relating to HACTL's premises, (that is, ST1 and the Express Centre) and the readiness of AR when the airport was expected to open for operation. FIDS was at that time just installed in the new airport, and was undergoing testing and commissioning. However, many significant problems in the system's operation were found, and the worry was whether it would be operating reliably when the airport opened. HACTL's premises were still under construction, and there were reports that the progress of the construction works had slipped with many weeks of delay, and it was feared that HACTL's services would not be available in April 1998. ADSCOM was also at about that time investigating with MTRC regarding whether AR would be ready for use in April 1998.

6.82 Regarding the first two of these three significant matters, W50 Wong on behalf of the AA Board assured ADSCOM that the problems with FIDS and HACTL would be duly resolved and both of the services provided on these scores would be ready in April 1998. AA's assurance to ADSCOM regarding the readiness of HACTL was based on assurances given by HACTL to AA that HACTL, with the supplemental agreement with its main contractor, GPY, would be ready for operation in April 1998 with 50% of its throughput capacity, which percentage together with the share of cargo handling that was to be done by AAT was assessed at that stage as to be sufficient to cater for the cargo facilities required of the new airport. On the other hand, as MTRC maintained that the project regarding AR could not be properly accelerated to be ready in April 1998, AA was making contingency transportation measures with the assistance of related Government departments that the new airport would be ready to open in April 1998.

6.83 On 12 January 1998, the AA Board had a meeting in which the date that the AA Board members considered being desirable for opening the new airport was discussed in detail. When the resolution to open the new airport was put to a vote, the ex-officio members of the Board abstained because they thought it only proper that the non-official members should make the decision without their participation as Government officials. The decision reached was that the new airport was ready to open in the last week of April 1998.

6.84 On the part of ADSCOM, in addition to the two meetings on 3 and 7 November 1997 referred to above, it held no less than four more meetings, namely those on 15 November, 8 and 20 December 1997 and 2 January 1998, before it finally decided on AOD. The decision was that the new airport should open on 1 July 1998, and that day was to be for the ceremonial opening. At a special meeting of ADSCOM on 8 January 1998, NAPCO suggested and ADSCOM accepted that 6 July 1998 was to be the operational commencement date of the new airport.

6.85 Whilst there was a certain amount of scepticism harboured by ADSCOM's members as to the airport being able to be ready in April 1998, mainly caused by the problems still encountered with FIDS and the delay regarding the completion of the HACTL buildings, the main reason for the decision to defer the expected date of April 1998 to 1 July 1998 was the inability of having AR ready earlier than 21 June 1998. This was despite the fact that there were contingency transportation plans in hand to provide adequate transportation facilities to link the new airport with other parts of Hong Kong. ADSCOM was of the view that if the new airport was to open with AR ready for operation, rather than relying on a scheme of makeshift transportation facilities, the operation of the new airport would be more smooth and efficient. The added period from April to 1 July 1998 would undoubtedly give more time to AA and HACTL to make FIDS and the cargo handling services better equipped, both of which were expected to be ready by the end of April. Based on the considerations of operating the new airport in a safe, secure, efficient and smooth manner, ADSCOM made the decision.

6.86 ADSCOM further considered that it would be necessary or at least more advisable for the airport to open operation on a Monday and reached the conclusion that 1 July 1998 should be the ceremonial opening date whereas Monday, 6 July 1998 should be the operation commencement date. There was an enormous relocation plan which was divided into five phases, the first one starting on 8 May 1998 and the penultimate one on the eve of the operation opening of the new airport. This relocation exercise was very important because it was only on the eve of the operational opening of the new airport that all the facilities and personnel from the Kai Tak airport that were required for CLK's operations, which or who were to remain in service until that eve, would have to be completely moved to CLK. The fifth phase would only take place after AOD. The phase 4 relocation would require participation of over a thousand heavy-duty vehicles, barges and aeroplanes, and ADSCOM accepted the advice that traffic on the roads between Kai Tai and CLK would be the lightest in the evening of Sunday night. The added advantage of opening the airport for operation on a Monday was that air traffic was the lightest on Monday and that would give a little more time and practice to the personnel and facilities at the new airport to gear up to the heavier air traffic expected of the days following.

6.87 Immediately after the decision was made by ADSCOM, the Chief Secretary informed the Chief Executive of the decision and the major reasons behind it. A paper was prepared for the ExCo meeting to be held on 13 January 1998. During the ExCo meeting, its members were informed of the decision and the reasons which they noted. The Commission finds that the Chief Executive and the ExCo members noted the decision and the reasons, and none of them expressed any view on the subject. The Chief Executive and the ExCo members should properly be treated as having approved the decision but not being involved in any process of the decision making.

6.88 Further, there is no evidence whatsoever that the decision to open the airport in July 1998 was a result of any political consideration or ulterior motive. There was only one single occasion during the ADSCOM meetings in November 1997 through to January 1998 where the officiating guest for the ceremonial opening was mentioned, and it was on 15 November 1997, before the decision on AOD was reached. The Chairman of ADSCOM stated that members should aim for the President of the Central People's Government as the officiating guest. In ADSCOM Paper 48/97 of 6/12/97 for discussion at the meeting on 8 December 1997, NAPCO proposed that the Chief Executive should be invited to sound out the President on the role of the Principal Officiating Guest as soon as possible. Those were the only references in all the voluminous documentation on the decision on AOD that could possibly be imagined as having any political flavour. Eventually, obviously in order to avoid clashing with other activities to celebrate the first anniversary of Hong Kong's reunification with the Mainland, the ceremonial opening of the new airport was rescheduled to 2 July 1998.

6.89 Since the decision on AOD was announced through the media on 13 January 1998, subsequent reports, either those orally made during meetings or in writing through papers to ADSCOM, from AA and NAPCO never hinted to ADSCOM that there were such risks on AOR that AOD should be altered. No one ever mentioned to the Chief Secretary or ADSCOM that there should be a consideration of deferring AOD. From all the voluminous contemporaneous documentary evidence that has been supplied to the Commission, there is no record that such an idea had been raised by anyone. ADSCOM was still overseeing the progress of the facilities and services essential for the operation of the new airport on AOD, but no one within or outside ADSCOM had ever intimated, let alone warned, that there was any risk of difficulty regarding the airport's safe, secure, efficient and smooth operation. On the contrary, AA was confident that PTB was ready for operation. It assured ADSCOM as late as 4 July 1998 that the permanent FIDS was stable, reporting that the standby FIDS had been successfully tested and confirming that various workarounds were well prepared. Apart from the assurances on a best endeavour basis given by the HACTL management that 75% throughput capacity could be achieved on AOD, W7 Charter, HACTL's Managing Director, also assured the Financial Secretary during the latter's visit to ST1 on 14 June 1998 that HACTL would be ready for AOD.

6.90 When the Chief Secretary gave evidence before the Commission, she categorically told the Commission that no one had ever informed her of any risk of allowing the new airport to be open for operation on 6 July 1998 or raised with ADSCOM a deferment of that date, and from what she was informed throughout her chairmanship of ADSCOM she did not anticipate that the new airport would open with so many and so serious problems.

6.91 In her witness statement to the Commission, the Chief Secretary made the following concluding remarks:

(a) The ACP was the most ambitious and complex infrastructural project ever undertaken by the Hong Kong Government. ADSCOM was established to provide the necessary oversight and perform essentially a trouble shooting role, ensuring that all parties involved worked towards the ultimate goal of delivering the entire programme within budget and on schedule. ADSCOM performed its functions in a proactive and critical manner, working together with AA, MTRC and the relevant Government departments in maintaining momentum, keeping costs under control and resolving the many interface problems that arose.

(b) From the start, ADSCOM's intention was to build a world class international airport that the community could be proud of. ADSCOM was aware of the serious operational problems that had confronted some new airports elsewhere on opening, with the consequent adverse publicity which took time to overcome. It was anxious to avoid this happening with the new airport. It wanted a safe, secure and efficient airport of international standard on Day One and these considerations were borne uppermost in mind when deciding on the opening date. No political considerations were involved.

(c) In all the circumstances, and having regard to AA's assurance that end April 1998 was a realistic opening date, ADSCOM felt that a July opening would give greater confidence. ADSCOM accepted that on first opening there would inevitably be some teething problems but it believed that the airport could cope reasonably well with both passengers and cargo on Day One. Unfortunately this did not prove to be the case. Any decision to postpone the opening of the airport should not be taken lightly. However, had there been the slightest suggestion from AA or HACTL that the new airport could not cope with either the passenger or the cargo flow on Day One for any reason at all, ADSCOM or Government would not have hesitated to reconsider the airport opening date.

6.92 The Chief Secretary was cross-examined as to her statement that ADSCOM would not have hesitated to reconsider AOD had there been any suggestion that it should do so. Her attention was drawn to the word "irreversible" in her letter to W50 Wong when discussions about the proper date for airport opening were on going at the end of 1997, as well as her utterance as noted in an ADSCOM meeting during the same period that once AOD was decided, she would expect everyone to "stick" to it. The Chief Secretary explained that these were confidential letter and notes and were to convey the meaning to AA that once decided, all persons concerned should exert their utmost to work towards meeting the target. She said that there would be consideration to defer AOD, for example, when a typhoon was expected, which would undoubtedly have an adverse effect on the relocation exercise from Kai Tai to CLK. She also said that if the Airport Control Tower was on fire, the opening must be deferred. W32 Schmitz gave another example : failure of AA to obtain an aerodrome licence. The Commissioners find that AOD by its nature simply could not be irreversible but, as pointed out by the Chief Secretary, it all depended on the cogency of the reasons in support of a deferment. In his testimony, W43 Oakervee, one of those who were privy to the confidential correspondence and notes of meetings between Government and AA, also denied that the date fixed by Government was "irreversible" in the sense that it could not be altered. He recognised that AOD, when decided, was the common target towards which everyone should work. While the AA Board was adamant that late April 1998 should be the opening date, ADSCOM rejected the idea and instead chose 6 July 1998 so as to allow sufficient time to have AR ready to provide a smooth and efficient transportation service to users of the new airport. Of course, once decided, AOD should not be lightly changed, for it was a decision creating the certainty on which many people such as airport operators relied. Nonetheless, if sufficiently weighty material was proffered, the Commission has no doubt that ADSCOM would certainly consider whether a deferment was necessary. The unfortunate thing was that no one ever suggested a deferment or put situations before ADSCOM that would, at the time, justify a revisit of the decision.

6.93 There was a suggestion by HACTL to various witnesses that there should be a "soft opening" of the new airport in that Kai Tak should be retained for HACTL to partially handle cargo for a short period of time after AOD before ST1 was put into full operation. That was also raised in the testimonies of W7 Charter and W2 Mr YEUNG Kwok Keung, the Managing Director and Deputy Managing Director of HACTL. In fact, the idea was discussed in correspondence between HACTL on the one hand and PAA and Government on the other in August 1995. At the time Government requested HACTL to be ready to provide 1.2 million tonnes of cargo handling capacity by April 1998, but if HACTL required operating partially at Kai Tak, Government would consider such requirement sympathetically. However, HACTL did not vigorously pursue the idea with ADSCOM or Government eversince that time.

Instead, HACTL's management gave assurances to AA and ADSCOM that ST1 would be ready to have 75% throughput capacity on AOD. When the announcement of AOD was made on 13 January 1998, W2 Yeung was reported by the media as saying that HACTL welcomed the added time from the original target of April to July 1998 and felt relieved. HACTL never hinted that it was not able to be ready for AOD. It was imbued with confidence about the systems the development of which it was responsible and proud of.

6.94 Having considered all the evidence and counsel's submissions very carefully, the Commissioners find that ADSCOM did not make any mistake in deciding that 6 July 1998 should be the date for the operational opening of the new airport. Indeed, ADSCOM members had exercised great care and diligence in reaching that decision. The main reason for ADSCOM's selecting July 1998 for opening the new airport was to await the completion of AR, and that was despite AA's insistence that all critical AOR items would be ready by late April 1998. MTRC maintained that the scheduled completion date of AR being 21 June 1998 could not be abridged, and ADSCOM decided to have the transportation service of AR available to airport users when the new airport opened instead of leaving them to resort to makeshift transportation facilities before AR was ready. Moreover, the added time of over two months between late April and early July would surely provide a comfortable float to the PTB and HACTL projects. The only reasonable conclusion that the Commissioners can reach is that it was a proper and wise decision.

6.95 During the period between January 1998 after the decision was made up till AOD, ADSCOM exerted no less efforts and care regarding the progress of the AOR issues. The continuous assurances given by AA and HACTL had lulled ADSCOM members into a false sense of confidence and security, resulting in their not revisiting the opening date. Indeed, no one had ever even uttered a word that they should do so. While everybody within AA, HACTL and NAPCO who provided witness statements to the Commission or testified before it was of the view that teething or settling problems might be expected, none ever anticipated the chaotic conditions that occurred on AOD. All concerned were taken by surprise. The Commissioners feel that it would be improper and unreasonable to hold ADSCOM or any of its members responsible for not appreciating the risks of keeping to AOD in the then prevailing circumstances.

6.96 The Commission has also examined the position of ADSCOM vis-à-vis the other bodies involved in order to decide on the responsibility of ADSCOM regarding the problems encountered on AOD and thereafter. ADSCOM is a high level committee for the purpose of making policy and strategic decisions in respect of ACP including the opening of the new airport. It has NAPCO as its executive arm. NAPCO is responsible for monitoring the work of AA, and contributing towards the coordination between AA and Government departments. NAPCO had site engineers to observe and critically assess the performance and progress of the works carried out by various contractors employed by AA, and it also had a CPM from outside Government. The CPM used to be Mr Tudor Walters, and on his retirement in July 1998, W32 Schmitz replaced him. Both Mr Walters and W32 Schmitz were senior officers of Bechtel, an international firm of airport consultants. As ADSCOM is basically a policy decision-maker, the every day monitoring of the performance and progress of the airport works was reposed in NAPCO. It would be unreasonable to expect members of ADSCOM to visit the site at CLK daily or even once in a while to attempt to exercise physical monitoring over the works. On the other hand, NAPCO with its site engineers and professionals should be able to observe the physical condition, assess the performance and progress of the works, and report to ADSCOM anything which should be ADSCOM's concern.

6.97 Indeed, ADSCOM's serious concern about the readiness of FIDS and HACTL before the decision on AOD was made in January 1998 was prompted by NAPCO's reports and critical comments through papers and oral discussions at the ADSCOM meetings. After January 1998, NAPCO had not slackened in its efforts and continued to report on the progress of the works, and critically assessed the progress of the essential AOR issues. The Commission's deliberation on NAPCO's role and duties is contained in Section 2 of Chapter 5. Having examined all the evidence and submissions very carefully, the Commission finds that there was generally sufficient communication and coordination between

ADSCOM and NAPCO. W36, the Chief Secretary told the Commission that she was satisfied with NAPCO's work and she was of the view that NAPCO had discharged its functions effectively and conscientiously. The Commission opines, however, that in performing its functions towards ADSCOM, NAPCO failed in two aspects. First, it should have inquired with AA whether it had the necessary know-how in monitoring HACTL's progress relating to the installation, testing and commissioning of the CHS equipment and systems, instead of merely assuming that AA was so qualified, but it failed to do so. Secondly, it should have checked whether AA had plans and contingency measures and should have had an overall assessment whether such plans and measures were adequate in view of the then prevailing circumstances. As a corollary, NAPCO should also examine whether AA had an overall risk assessment. NAPCO should be responsible for these omissions. The detailed analysis can be found in paragraphs 5.66 to 5.68 of Chapter 5. ADSCOM's responsibility has been dealt with in paragraphs 5.70 to 5.74 of Chapter 5. The evidence shows that ADSCOM had the duty of an overall monitor and it had delegated the duty of the overall monitor of the progress of AOR to its executive arm, NAPCO and directed it to discharge the duty. The Commissioners find that towards the public, ADSCOM should be responsible for NAPCO's failure.

6.98 The responsibilities of the AA Board and management regarding AOD will be dealt with in later chapters when their involvement on the problems encountered at AOD will be addressed in detail.

CHAPTER 7

AIRPORT OPENING – THE PROBLEMS AND THEIR DEBILITATING EFFECT

7.1 The decision of the Commissioners on whether the new airport was ready to open on airport opening day ("AOD"), 6 July 1998, depends on their examination of the problems encountered on that day and shortly thereafter. If only a few minor problems had surfaced, the airport would obviously be viewed as ready to open for operation on AOD. Despite the efforts of all involved or interested parties, this was not to be, unfortunately.

7.2 Numerous problems occurred. Many of the problems were inter-related and intertwined, and it tends to confuse the observer as to what was the cause and what was the effect or consequence. In this chapter, the Commission identifies the problems encountered, describes their debilitating effect, individually and collectively, and narrates the situation on all fronts.

7.3 The ceremonial opening officiated by President Jiang was on 2 July 1998, immediately following the celebration and commemorative activities for the anniversary of Hong Kong's hand-over that had taken place the day before. Phase 4 of the relocation exercise in which all the required facilities and equipment were moved from the Kai Tak airport to the new airport at Chek Lap Kok ("CLK") was performed in the night of 5 and early hours of 6 July 1998, in order to make the new airport fully operational in the morning of 6 July 1998. There were occasional drizzles that night, but as anticipated and planned, traffic on the roads between Kai Tak and CLK was light, and the relocation was smooth with little occurrence worthy of concern to anyone interested.

7.4 The first flight was to arrive at the new airport at about 6:30 am on 6 July 1998, AOD. The Chief Secretary for Administration of the Hong Kong Special Administrative Region, who is also the Chairman of

Airport Development Steering Committee and some of her fellow members, the Chairman of the Board of the Airport Authority ("AA") and many of his colleagues, as well as the Chief Executive Officer of AA and his staff were all there waiting for the first arriving passengers to present them with souvenirs to mark the occasion. Most of the receiving group had little sleep the night before, because of their involvement one way or another with the relocation process. Nothing untoward happened when a flight from New York landed, and the ceremonial reception of the first couple to arrive was none other than a pleasing event.

7.5 Shortly after 8 am, after clearance at the immigration counter, a number of arriving passengers had difficulty finding out where to retrieve their luggage. The Flight Information Display System ("FIDS") monitors and the liquid crystal display ("LCD") boards that were situated at the entrance to and inside the Baggage Reclaim Hall ("BRH") were either blank or displaying the number of an incorrect reclaim belt on which baggage was to appear. Those who noticed the few whiteboards on which reclaim belt numbers were written had to crowd around these whiteboards to obtain the information, and after that, had to wait for a long time for their baggage. At the same time, people who came to the new airport to meet their relatives, friends or customers were not able to get correct flight information on the monitors and the LCD boards that were supposed to show all relevant flight information, including flight status (ie, the plane has arrived or not), the estimated time of arrival, the actual time of arrival and the meeting gate (ie, either Gate A or Gate B from which the passengers will exit to the meeting and greeting area). They were not able to estimate when those whom they expected would come out. Obviously, all these caused inconvenience and anxiety to the arriving passengers and their meeters.

7.6 In the meantime, departure passengers were not provided with boarding gate numbers that should normally appear on boarding passes. The airline staff could not help, for they did not have the required information either. All were not able to get any or accurate flight information regarding the outgoing flights on the monitors and LCD boards, such as the estimated time of departure, the actual time of departure and the boarding gate number. Sometimes, information was displayed on some monitors and LCD boards, but was inconsistent with that shown on other monitors. The situation was the same both on the landside and the airside (where access by the general public is denied) of the huge Passenger Terminal Building ("PTB"). After the departing passengers had gone through immigration and security clearance, they reached the airside where AA provided two whiteboards situated at the Information Counter in the Departures Hall. On these whiteboards, current flight information that AA staff could get would be shown. However, the assistance of the whiteboards was rendered only to those departing passengers who happened to inquire with AA's attendants or chanced to see the whiteboards. Many people were jostling around the whiteboards seeking information while AA staff were busy putting on the most current information. Those passengers who did not know of the existence of the whiteboards were anxious and confused. There were also many changes to the gates allocated. Many passengers were running up and down the large Departures Hall looking for the right boarding gate for their flight. They had to make great haste to find the proper gate which they would otherwise normally do leisurely. Some of them even missed the plane. The same lack of flight information and status affected airline staff who were either manning the check-in desks or working elsewhere in the airport, causing confusion and inconvenience to them.

7.7 Arriving aircraft experienced delay in having a gate or a remote stand allocated to them for parking. The delay was aggravated for aircraft that arrived later, because of domino effect. From around noon to 5 pm and from 8 pm to 11 pm, the apron was full and arriving aircraft had to wait on the taxiway for a stand to be allocated because a stand would only be available after another flight had departed. The delay was so bad that some planes had to stay on the tarmac for over an hour, when the passengers were not allowed to alight and the air in the plane became stuffy so as to cause nausea or dizziness to some occupants. When the plane was able to park at a remote stand, it would have to wait for the passenger steps and buses. With some of the planes that parked at the terminal stands, their passengers were exasperated when the airbridge linking the plane door to the arriving gate was unable to operate. The late parking of the planes and the stalled disembarkation of arriving passengers compounded the delay suffered by departing passengers.

7.8 Even when arriving passengers were successful in getting off the plane, their plight was to wait for two to three hours for their baggage, and some even had to leave the airport without their baggage, which could not be found. As from about 10 am, the baggage handling operator experienced difficulty in assigning reclaim belts by the use of the Flight Information Display System ("FIDS") workstation, and the reclaim belts were not assigned to flights in time or at all. The arriving passengers had no information from FIDS or from airlines on the proper baggage reclaim belt, resulting in anguish and frustration. Although the several whiteboards at the BRH alleviated the situation, the passengers were exasperated because their baggage would arrive at the belt late. Three ramp handling operators ("RHOs") were to handle departure, arrival and transfer bags. They had to go to the aircraft to unload the baggage and bring it to the Baggage Hall on level 2, a sort of basement area, of PTB. Not that RHOs were not trying to serve the passengers, but they simply could not cope. Due to the inefficiency of FIDS, they did not know where the aircraft they had to serve were, and finding them took effort and time. The stand changes and serious flight delays also compounded their difficulties and strained their resources. They did not know which baggage lateral was assigned for them to bring arrival baggage to. There were thousands of departure or transfer bags swamping around the problem bag area in the Baggage Hall. Early in the morning, about 420 bags arrived at the new airport from Kai Tak, 220 of which were fed into the Baggage Handling System ("BHS") without baggage labels. These bags could not be read by BHS, and they became problem bags that had been outcast from the normal departure laterals and ended up at the problem bag area. Various problems with baggage handling on AOD created about 6,000 problem bags lying around in Baggage Hall, and the place was an eyesore.

7.9 RHOs had to provide services for the disembarkation of passengers, by operating the airbridges that linked the arrival gates to the planes or to provide steps for the aircraft parked at remote stands. They did not know what stands were allocated to the aircraft they served, and they had to drive around on the tarmac or send runners to the airfield to locate the planes. Even after stand allocation and other necessary flight information was available at the Airport Emergency Centre after 4 pm, RHOs had to send their staff there to obtain such information. These staff attempted to relay the information to their operation staff through Trunk Mobile Radios ("TMR") or mobile telephones, but these facilities frequently failed them. Delayed by difficulties obtaining flight information from FIDS and other means of communication, RHOs were late in providing steps and buses and passengers had to wait to get disembarked and taken to the PTB.

7.10 When passengers, those accompanying them and those meeting them were put in a situation without reliable flight information and were stranded for hours in PTB, they turned to the telephone. There were also many sightseeing visitors to PTB on the new airport's opening day. To their dismay, many of the public telephones in PTB, both at landside and airside, were not working. Mobile phones were also employed, but with unsatisfactory results, because the networks were overloaded. Overloading resulted from competing demands of users and operators of the new airport at the same time. The passengers and visitors who were stuck in PTB did not feel too comfortable because the temperature was insufficiently low. The air-conditioning was not functioning properly. Many who used the toilets found that they had to wait for quite sometime and the facility was over-crowded. Some of the toilets were filthy, as the flushing system did not always function, tap and flushing water was occasionally cut off, and there were too many users. Some had to walk up or down the steep steps of certain escalators that did not work, and the signage showing directions did not fully satisfy users' needs. Restaurants and refreshment facilities were overcrowded and refuse bins spilled over. All these added insult to injury.

7.11 Those who attempted to get to the new airport by public transport found themselves in a jam, for the road works surrounding PTB were not fully completed. There were long lines of buses congesting at and close to the bus stop at Cheong Tat Road outside PTB, and there were long queues of people, arriving passengers and visitors alike, waiting to board buses. There was congestion in passengers flow as alighting passengers did not know how to get into PTB since the passenger lifts and escalators had not yet become operational.

7.12 On the cargo front, the situation was not at all better. There were two cargo terminal operators ("CTOs"), namely Hong Kong Air

Cargo Terminals Ltd ("HACTL") and Asia Airfreight Terminal Company Ltd ("AAT"). Apart from serving aeroplanes and passengers, RHOs also transported cargo to either of these CTOs. They brought the cargo they unloaded from aircraft on dollies (ie, a kind of wheeled platform dragged by a motor tractor) to AAT's or HACTL's premises to hand over the cargo. Due to the smaller size of AAT's operations, handling about 20% of all cargo, the problems were not too serious. It was very different with HACTL. RHOs were often not able to find HACTL's staff at the interface area for cargo transfer. They originally left the cargo on the dollies at the interface area, and returned to their other duties. However, as time went on, they found that the dollies that they had left before at the interface area were still occupied by cargo and they could not retrieve them for further use. As a result, they put the cargo on the dollies onto the ground and retrieved the dollies. Hundreds, if not thousands, of pallets and containers of cargo occupied the interface area between the ramp and the two CTOs' premises, which in turn caused difficulties and delay to AAT's and HACTL's personnel to identify, locate and remove.

7.13 It was not an exaggeration to describe the new airport as a pandemonium for men, cargo and aeroplanes resulting from failure of computer systems. Aeroplanes had to queue to park and be served by RHOs, RHOs' tractors, vehicles, dollies and equipment were working furiously to try to cope, FIDS including its monitors and LCD boards functioned hopelessly, the air-conditioning went slow, some escalators ground to a halt, and the Cargo Handling System ("CHS") at HACTL failed to respond properly. Baggage and cargo did not often succeed in finding their way to their owners or custodians and when they did they were long overdue. For many hours, there was a full apron of aeroplanes, and outside and inside PTB, there were crowds of people, either running around to look for the proper gate to board planes or waiting for baggage, friends and relatives, and transport. Although the staff of AA, airlines, RHOs, and cargo handling operators were working hard, such work was to little avail, for passengers and visitors remained greatly inconvenienced, annoyed and alarmed at the services provided.

7.14 The chaos went on for a few days, although some of the problems might not be noticed by particular individuals. Many problems were identified through the complaints of users of the new airport and through media reports. Each of these problems is dealt with in later chapters. They are summarised below:

(1) The unreliable working of FIDS, with malfunctioning of monitors and LCD boards that were supposed to show flight information
(2) The breakdown of cargo handling by HACTL which eventually imposed an embargo on most import cargo and some export cargo
(3) Delay in flight departure and arrival
(4) Malfunctioning of the Access Control System
(5) Confusion over parking of planes
(6) Malfunctioning of Aircraft Parking Aids
(7) Late arrival of tarmac buses causing delay to disembarkation of passengers
(8) Insufficient passenger steps and miscommunication amongst staff handling the same
(9) Airbridges malfunctioning
(10) Chaos in baggage handling including malfunctioning of monitors and LCD boards in the baggage reclaim area
(11) Public Address System malfunctioning
(12) Airside security risks
(13) Congestion of vehicular traffic and passenger traffic
(14) No tap water in toilet rooms and tenant areas
(15) No flushing water in toilets
(16) Toilets too small
(17) Urinal problems with water flow, infrared sensors and cleanliness
(18) Insufficient air-conditioning in the PTB
(19) Large number of public telephones not working
(20) Mobile phone service not satisfactory
(21) TMR service not satisfactory
(22) Escalators breaking down repeatedly
(23) Insufficient or ineffective signage
(24) Slippery and reflective floor
(25) Problems with cleanliness and refuse collection
(26) No sufficient water, electricity and staff at restaurants

(27) Insufficient staff canteens
(28) Automated People Mover stoppages
(29) The Airport Express ("AE") ticketing machines malfunctioning
(30) The AE train delay.

7.15 AAT had difficulty to deal with all the cargo it was supposed to handle on AOD. On 18 July 1998, AAT successfully made arrangements with the nearby Airport Freight Forwarding Centre to use the latter for breakdown, storage and collection of the backlog cargo, and thenceforth, the severe congestion at AAT's terminal started to abate. The backlog that had been built up from Day One was cleared by 13 August 1998. It took AAT over six weeks to return to normality.

7.16 The CHS of HACTL was operating slowly and inefficiently throughout the day on 6 July 1998. A huge backlog of cargo was built up along its interface on the airside to the north of SuperTerminal 1 ("ST1"), HACTL's main premises. In the early morning of 7 July 1998, the inventory of cargo kept by the computer disappeared. The whole CHS had to be shut down for checking and repairs. All the cargo that had been moved there from Kai Tak and from the ferry flights arriving at CLK on 6 and 7 July had to be transferred to HACTL's premises and facilities at Kai Tak for processing. On 8 July 1998, HACTL, which handled about 80% of cargo exported and imported at the new airport, announced an embargo on all imported cargo save for a very small number of items. Export cargo had to be sent by shippers to Kai Tak for processing before they would be transferred to the new airport to board the flights. The embargo was extended to 9 July and then to 18 July but it was further extended with its four-phase recovery programmes. Even though the amount of export cargo processed by HACTL at CLK grew gradually, it was not until 23 August 1998 that all import and export cargo could be normally handled by ST1.

7.17 The embargo and the delay in handling cargo gave a hard time to cargo owners, importers, exporters, shippers, freight forwarders, and all those who made a living out of air cargo. While many perishable goods simply became rotten and had to be discarded, some cargo was missing. The businesses of the people in these fields were seriously disrupted, and many suffered substantial financial loss.

7.18 The furore that was brought by the opening of the new airport was replaced with initial dismay and eventual disappointment. The inconvenience experienced by passengers and visitors and the hardship suffered by the air cargo trades received intensive and extensive coverage of the media. Many were complaining about the unreadiness of the new airport to operate on AOD, others were crying shame on the lack of efficiency, and the rest were estimating the size of the financial losses. All of them converged to profess that Hong Kong had not only lost substantially in money, but suffered severely in its position and reputation as the most efficient city in the world and as South East Asia's hub of international civil aviation for both cargo and passenger.

CHAPTER 8

THE STANDARDS OF CLASSIFICATION – FROM TEETHING TO MAJOR PROBLEMS

8.1 In paragraph 7.14 of the preceding chapter, all the problems facing the new airport on airport opening day (“AOD”) and shortly thereafter have been identified. However, after the commencement of the inquiry, there were allegations of further problems, namely:

(a) rats found in the new airport;
(b) an arriving passenger suffering from heart attack not being sent to hospital expeditiously on 11 August 1998;
(c) emergency services failing to attend to a worker nearly falling into a manhole while working in Passenger Terminal Building (“PTB”) on 12 August 1998;
(d) fire engines driving on the tarmac crossed the path of an arriving aircraft on 25 August 1998;
(e) traffic accident on 28 August 1998 involving a fire engine, resulting in five firemen being injured;
(f) on 3 September 1998, a maintenance worker of Hong Kong Aircraft Engineering Company Limited (“HAECO”) slipped on the stairs inside the cabin of a Cathay Pacific Airways Limited (“Cathay Pacific”) aircraft;
(g) on 6 September 1998, a Hong Kong Airport Services Ltd. (“HAS”) tractor crashed into a light goods vehicle, injuring five persons;
(h) on 8 September 1998, a power cut occurred, trapping passengers in lifts and on the Automated People Mover (“APM”) as well as delaying two flights;
(i) missed approach by China Eastern Airlines flight MU503 on 1 October 1998;
(j) tyre burst of United Arab Emirates cargo flight EK9881 leading to runway closures on 12 October 1998;

(k) power outage of SuperTerminal 1 (“ST1”) due to the collapse of ceiling suspended bus-bars on 15 October 1998; and

(l) radio frequency interference on Air Traffic Control frequency.

8.2 According to the methodology of the Commission, while minor problems that occurred after its appointment would generally not be dealt with in any detail, problems that might be serious were to be looked into unless they occurred too close to the conclusion of the inquiry as to make investigation impracticable. For the purpose of concentrating on serious or major problems, the Commission thought it proper and reasonable only to spend time and energy on minor or “teething” problems to the extent that they are due. Not only did the Commission have a deadline of six months to meet, and that manpower and money should not be deployed to deal with insignificant or inconsequential matters, minor problems should reasonably be viewed as not having any significant effect on the users of the new airport or the reputation of Hong Kong.

8.3 There should, therefore, be an initial evaluation or classification of the problems identified so as to rank their seriousness whereby the priority in which time and manpower to be spent in inquiring into them should be properly placed. The classification is also necessary for better appreciation of the degree of impact that each problem had on the operations of the airport and on passengers as well as airport operators. For this purpose, W51 Mr Jason G YUEN and W55 Dr Ulrich Kipper were most helpful in contributing their respective perspectives on the standards of quality regarding airport services and facilities, whereas the Commissioners would determine the appropriate yardstick using their knowledge of circumstances in Hong Kong and as visitors to various airports around the world.

8.4 Having considered the opinions of W51 Yuen and W55 Kipper, and bearing in mind the facts as found from the evidence that the Commission accepts, the Commissioners are of the view that the problems encountered on AOD and shortly thereafter can be divided into three classes: minor problems (which include teething problems), moderate problems and major problems. While the categorisation must be a matter of degree, certain criteria are adopted to judge the proper slot into which a problem should be put. This criteria is set out below. The Commissioners freely quote the experts' views as adopted by them.

8.5 Despite the scientific and technological advancement in recent years, human foresight is still very limited, so that not everything one handles will turn out the way that is foreseen. Good planning is therefore important in the development of a project, but good planning does not necessarily mean perfect planning, and problems that cannot be reasonably foreseen or contemplated by the human brain will often occur. Further, sometimes it is necessary to run new machines and systems for a period of time for them to operate smoothly. That is why a new motor car has to be run-in for several thousands of kilometres after which its various parts have to be checked, corrected, repaired or replaced. An airport is thousands of times more complicated, with extremely complex facilities. W51 Yuen opines that the startup of a new major airport will inevitably encounter various glitches, malfunctions, mishaps and technical problems. These abnormalities are sometimes prevalent, and usually accepted by airport operators and users as minor inconveniences at startup as **"teething problems"**, similar to the temporary pain a child must go through during the eruption or shedding of teeth. They are not desirable but are generally viewed as facts of life. W55 Kipper describes teething problems as those that will inevitably occur during the first few days of operation, irrespective of the conscientiousness of the pre-operational testing and commissioning activities. He states that even if all problems exposed by testing and airport trials before airport opening have been solved, new problems will occur after airport opening because of the complexity of all linked airport processes and the unavoidable discrepancies between simulated and real live load.

8.6 To what extent the abnormalities are considered teething or minor problems depends on the service standards and the tolerance level of the airport operators and users. For a premier international airport such as that at Chek Lap Kok ("CLK"), the Commissioners adopted the opinion of W51 Yuen that the startup abnormalities should be no greater than those experienced at other world-class airports of similar size. W55 Kipper contributed his views from a European angle. The following are the criteria taken as proper and reasonable for assessing the seriousness of each of the problems encountered on AOD. For a problem to be determined as a **teething problem**, it must meet each and every one of the following criteria:

(a) Criterion 1 – The nature of the problem must not involve safety. Any malfunctioning that endangers the personal safety of people should not be considered as a teething problem, regardless of whether it has occurred at any other airport, or how commonly it has occurred. A distinction must be drawn between problems that cause inconvenience or minor financial loss or loss of business opportunities against those that put the lives of people at risk.

(b) Criterion 2 – The magnitude of the problem must be limited. The problem must not be pervasive in relation to the size of the field. For example, if the terminal has 50 escalators and three malfunctioned on opening day, that may be considered a teething problem. However, if the terminal has only six escalators and three malfunctioned, there may be something intrinsically wrong with the escalators.

(c) Criterion 3 – The inherent cause of the problem must not be a fundamental failure. Problems caused by poor workmanship, misalignment, defective parts, accidental damage, operator error and the like can be considered as teething problems. However, problems caused by design errors, improper planning, mismanagement, and gross negligence are not teething problems.

(d) Criterion 4 – The recovery period for overcoming the problem must be short, with rare or no subsequent recurrence. As a rule of thumb, a teething problem should not last more than a few days. In cases where permanent corrective work requires more time, temporary measures must be able to alleviate the problem within a few days. Moreover, there should only be rare or no recurrence of the problem after the recovery period, other than the normal rate of failure occurring universally.

(e) Criterion 5 – The problem must be beyond the operational norms of an airport. Certain problems will occur in an airport under normal circumstances. For example, on the average, one can expect two bags out of 10,000 to be misdirected or lost. Misdirecting two bags out of 10,000 should be considered as a fact of life at the airport, and not a startup problem, teething or otherwise.

8.7 Although a problem may not be able to satisfy all the five criteria as to be a teething problem, it can still be considered a **minor problem** insofar as it satisfies Criteria 1 and 2 above, as its impact on users is not widespread or reasonably perceived to be serious. They normally do not attract widespread public attention and are soon forgotten when the situation is rectified. If the problem is pervasive, affecting almost all airport users or a certain large class of airport users, or it seriously affects an area of airport operation that is considered to be important, then it is a **major problem**. In between, there are **moderate problems**, where the impact of the problem is widespread, affecting a large number of users, or the problem is in respect of an area reasonably considered to be an important area of airport operation, but if the degree in each of these qualifying factors is less than that for a major problem, then the Commissioners will classify it to be moderate. It should also be mentioned that some problems are classified as moderate although normally they may be classified as minor except for the fact that the extent and length of inconvenience caused to airport users are much larger and longer.

8.8 Applying the above criteria, the Commissioners are of the view that the abnormalities set out hereunder as experienced at the new airport are **teething or minor problems**. These problems are grouped together because there should be little difference in their treatment. The reasons for their conclusion regarding each can be found in paragraphs 8.9 to 8.24:-

[1] Mobile phone service not satisfactory
[2] Trunk Mobile Radio ("TMR") service not satisfactory
[3] Public telephones not working
[4] Escalators breaking down repeatedly
[5] Insufficient or ineffective signage
[6] Slippery and reflective floor
[7] Problems with cleanliness and refuse collection
[8] APM stoppages
[9] Airport Express ("AE") ticketing machine malfunctioning
[10] AE delays
[11] Late arrival of tarmac buses
[12] Aircraft parking confusion
[13] Insufficient ramp handling services
[14] Airbridges malfunctioning
[15] No tap water in toilet rooms and tenant areas
[16] No flushing water in toilets
[17] Urinal flushing problems
[18] Toilets too small
[19] Insufficient water, electricity and staff at restaurants
[20] Rats found in the new airport
[21] Emergency services failing to attend to a worker nearly falling into a manhole while working in PTB on 12 August 1998
[22] Traffic accident on 28 August 1998 involving a fire engine, resulting in five firemen being injured
[23] A maintenance worker of HAECO slipped on the stairs inside the cabin of a Cathay Pacific aircraft on 3 September 1998
[24] A power cut occurring on 8 September 1998, trapping passengers in lifts and on the APM as well as delaying two flights
[25] Missed approach by China Eastern Airlines flight MU503 on 1 October 1998

8.9 [1] Mobile phone, [2] TMR, and [3] Public telephones not working. There was no extraordinary or abnormal problem with the TMR network used by Airport Authority ("AA") inside PTB. Among the other networks, TMR and normal mobile phone services provided and operated by Hutchison Telecommunications (Hong Kong) Ltd ("Hutchison") experienced problems with system overload. China Motion United Telecom Limited also experienced congestion in its TMR network, while SmarTone Mobile Communications Limited and Hong Kong Telecom CSL Limited also experienced system overload. However, the huge number of users of the two types of services were not reasonably anticipated when their capacity was planned, because there were a large number of visitors, stranded passengers, ramp handling operators' ("RHO's") staff and airline personnel using the systems on AOD due to the inefficiency of Flight Information Display System ("FIDS"). Had the necessary flight information been available through FIDS, RHOs and airlines would not have needed to use TMR and mobile phones so frequently, passengers and those greeting and meeting them would not have had to stay in PTB for hours, and the demand on the services of the two types of networks would not have exceeded their capacity. The problem was exacerbated because only about one-third of the public telephones planned to be made ready on AOD were operational. There were 322 payphones installed in PTB on AOD, but only 118 of them were operational. Out of the 43 courtesy phones installed on AOD, only 32 were functioning. Although there was minor malfunctioning of phone equipment reported by AA, the main cause for the out of service phones was incomplete cable connections. Insufficient telephones would normally only cause a little inconvenience and some waiting time for users. The unexpected demand on AOD, due to the large number of delayed passengers and visitors, however, made the unavailability of a large number of public telephones more serious. Subsequently, the following numbers of telephones became operational: from 150 on AOD to 329 on 20 July, 377 on 25 July, and a total of 382 on 3 August 1998. Hutchison, as with the other network operators, completed the enlargement of the capacity of their respective mobile phones and/or TMR services within a few days after AOD, and the problems have not since recurred. There were problems, on the other hand, with poor signal strength in some airline offices and portions of the ramp. They are fundamental inadequacies and therefore cannot be treated as teething problems. However, these problems were rectified by relocating antennae and installing new ones very soon after AOD, and as such they were minor. Most of the planned number of public telephones were ready for operation by 25 July 1998.

8.10 [4] Escalators. Two out of 61 escalators were not operating on AOD. In respect of the 59 escalators in operation, there were 20 incidents of stoppages on that day and 19 such incidents on the following day. The stoppages were due to one of three causes: (a) improper setting of safety device, (b) foreign articles jamming the units, and (c) people pushing the emergency stop button not in a case of emergency. Causes (b) and (c) are normal occurrences at airports or in public buildings. The safety device under (a) was set at too sensitive a level, so that slightly heavier load would trigger a stop. The sensitivity level was adjusted on 8 July 1998 having taken into account the actual working condition in the new airport and no further stoppage was caused by this reason. This is a classic teething problem.

8.11 [5] Insufficient or ineffective signage. During the first three airport trials that took place in January, February and March 1998, comments from participants were collected with the consequence that a number of signs were redesigned and ordered, albeit some were only ready after AOD and then had to install without delay. There were 1,500 signs in PTB on AOD and they all worked well, except one with an arrow pointing the wrong direction. The design of the statutory signs required by Government departments such as the Fire Services Department and Buildings Department had all been approved by the departments and their installation was complete before AOD. The design of the directional signs was based on the logic of the usage of various parts of PTB for which the signs were installed. The principal confusion relating to signage was caused by visitors or departing passengers wishing to go to the Departures Hall from the Arrivals Hall, as their wish was not in accordance with the logic of the usage of the Arrivals Hall where only few signs would show them the way to the Departures Hall. On AOD, however, most of the confusion among the passengers and visitors was caused by the unfamiliarity with the new facilities, an operational change that diverted departing passengers into the Arrivals Hall, and the FIDS failure, and not by signage. Furthermore, the misdirected sign as mentioned above was corrected in one day. Temporary signs were put up to alleviate the confusion on AOD and permanent signs when available were subsequently installed. As opined by W51 Yuen, the signage philosophy adopted by the architect, as discussed below, may have also contributed to the public's complaints. Signage additions, revisions, and refinement is quite common among major airports after the terminal is put to actual use. There are two schools of thoughts in airport terminal signage: (1) use the minimum number of signs necessary to direct people in order to reduce clutter for a more aesthetically pleasing terminal environment. Most architects prefer this philosophy unless the airport operator has a strong voice in the design; and (2) provide signs for directions as above, but in addition to these necessary signs, install signs in between as backups in case the first sign is missed. These additional signs also serve as confirmation of direction to assure people that they are proceeding in the right direction. Most airport operators and airport users prefer this second school of thought, even though there may be some sacrifice on aesthetics due to cluttering. However, the philosophy of signage in the new airport was based on the first school instead of the second one.

8.12 [6] Slippery and reflective floor. Like the signage situation, the first few airport trials brought about many criticisms on the floor of PTB. It was pointed out that the polished Zimbabwe Black granite insets and borders of the flooring were slippery and too reflective, and they pose a physical risk and a source of embarrassment for ladies wearing skirts. As a result, instructions were given by AA to contractors to hone the reflective and slippery granite. After some honing was done, the work was considered to be too time-consuming. It was subsequently decided that a proprietary material should be applied to the granite to reduce its lustrous and slippery nature instead. Only five incidents of persons slipping were reported and two of these were associated with water on the floor and only one man was required to be and was duly sent to hospital as he received a small wound in his arm. In view of approximately six million people using PTB during this period, the rate of these incidents did not appear out of the ordinary. However the reflective nature of the black granite can still be a cause of complaint, especially from ladies wearing skirts.

8.13 [7] Problems with cleanliness and refuse collection. There was substantial build-up of rubbish on AOD due to AA and tenant contractors' construction activities. This build-up of rubbish during the final days of construction is typical of major projects. However, due to the scale of the work at CLK, even 400 day shift and 150 night shift refuse cleaners working two weeks prior to AOD could not keep up with the build-up. All contractors' cleaning labour were deployed starting 7 July. On AOD, there were a large number of visitors and delayed passengers using the catering facilities on AOD extensively. The resulting cleaners, such as used food boxes and unfinished food, found their way around refuse bins that were full. The amount of rubbish was unexpected because the number of users of PTB for a lengthy period was not foreseen. The problem continued on 8 July due to access problems for staff and vehicles removing rubbish. Most rubbish was cleared by 10 July.

8.14 [8] APM stoppages. There was one incident at around 11:30 pm on 20 July 1998 where one passenger and four airport staff were trapped in the APM, which was the means of fixed track transportation situated in the basement of PTB for moving passengers along its east and west parts. The line is about 800 metres long, with two parallel tracks joined at the ends by a loop. Train No. 3 arrived at the West Hall departures station where all passengers were supposed to alight. One passenger and four airport community staff got on board when all passengers had alighted. Train No. 3 proceeded as programmed to the West Turnback, but stopped when it detected that Train No. 2 had stalled at the West Hall arrivals station. It appears that the people trapped in Train No. 3 tried to force open the doors which set off an alarm to the Airport Operations Control Centre. Before the maintenance staff arrived to restore Train No. 3, a trapped passenger tried to pry open the door by turning the emergency door release valve and eventually got onto the emergency walkway. For safety reasons, the APM operator immediately shut down traction power in the tunnel and the passengers were escorted to the West Hall departures station. The problem was caused by the passenger and the staff getting on board despite announcements not to do so. This occurrence could have been prevented if security staff had been stationed at the platform to ensure that no one boarded the train there. This precaution was subsequently adopted by AA soon after the incident. There has been no recurrence. There were also reports of minor stoppages of the APM due to door failures resulting from doors being forced open by passengers, or trains undershooting or overshooting their designated stops. To reduce the sensitivities of doors to passenger interference, the contractor increased the time between the door circuit receiving a signal of interference to door failure. By the end of August 1998, the contractor has not received any further reports of door failures. Station attendants are also present to ensure that APM passengers do not force open doors.

8.15 [9] AE ticketing machine malfunctioning and [10] AE delays. When AE went into operation, 41 out of 52 ticketing machines were operational. A number of them could accept bank notes but could not handle coins or give change. Since service counters were available for purchasing tickets, and staff were assigned at the machines to provide change, inconvenience to the public was kept to a minimum. Moreover, since the number of machines installed was based on future growth, the number of working units was probably sufficient to meet the demand. All machines were working properly by 24 July 1998. There were minor and singular train service disruptions on 9, 11, 14, 23 and 27 July, when passengers were transferred to another train. The most serious disruption to the AE service occurred on 23 July when the Tsing Yi station declared a red alert resulting in the temporary suspension of the temporary suspension of the Tung Chung Line and a 20-minute frequency for AE. On 27 July, AE was delayed for 19 minutes due to a signal error. These incidents appeared to be isolated cases of equipment failures at the startup of a new and major rail system, causing relatively minor inconvenience to passengers.

8.16 [11] Late arrival of tarmac buses. There were delays of tarmac buses in meeting the demand for transporting passengers between the terminal and remotely parked aircraft. However, the delays were generated by: (a) lack of accurate and prompt flight information due to the deficiency of FIDS; (b) reallocation of aircraft stands and increased usage of remote stands due to delayed flights and malfunctioning of the airbridges; (c) communication difficulties due to overloading of TMR and mobile phones; (d) poor co-ordination between boarding gate assignment and location of aircraft; (e) usage of tarmac buses as boarding lounges in lieu of holding rooms in terminal; and (f) failure of the Access Control System ("ACS"). Without these factors, tarmac buses might not have been delayed in meeting passengers or at least the delay would not have been inordinate.

8.17 [12] Aircraft parking confusion. On 6 and 7 July 1998, aircraft stand allocation had to be performed manually due to the problems with SAS and TMS. Stand allocation was made with delay, mainly due to the inefficiency of FIDS and TMS. The extended stay of aircraft due to delays in flight departures eroded parking capacity and made the allocation task more difficult. Since the vacancy of parking stands was uncertain, it was nearly impossible to plan parking assignments effectively. Further compounding the problem was communication problems among operational staff. In addition, problems such as the malfunctioning of some airbridges and ACS doors, insufficient towing tractors due to the amount of aircraft repositioning required, non-familiarity of push-back procedures by some tractor drivers, pilots not fully familiar with the apron, taxiways and remote stands and so farther also exacerbated the problem.

8.18 [13] Insufficient ramp handling services. Two passenger disembarkation methods were employed at the new airport, via airbridges when the aircraft was parked at frontal stands at PTB, and via mobile steps and tarmac buses when the aircraft was at a remote stand. The problems with airbridges are discussed under item [14] below, and the late arrival of tarmac buses are discussed under item [11] above. Since the tarmac buses and the mobile steps work together in the disembarkation of passengers, most of the discussion on the problem with tarmac buses also apply to mobile steps.

8.19 [14] Airbridges malfunctioning. There were serious delays in disembarking passengers via airbridges. Operators could not arrive at the airbridges in a timely fashion, and the delay was mainly caused by the lack of flight information due to the slow response of FIDS. Swipe cards for operating the airbridges malfunctioned and were replaced by keys two days prior to AOD. However, insufficient keys were issued, inconveniencing the airbridge operators and resulting in delay in disembarking passengers. There was also a programming error in the software for controlling the airbridges. The misplacement of one line of programming code caused incorrect sequencing of the bridge components, which caused intermittent alarms and airbridge malfunctioning for some B-747 aircraft. The malfunctioning of doors on airbridges, which were controlled by ACS, also contributed to the operators' inability to access the airbridges. HAS, one of the RHOs, which operated the airbridges, reported that emergency glass had to be broken to release a door to allow passengers to get through.

8.20 [15] No tap water in toilet rooms and tenant areas, [16] no flushing water in toilets, and [17] urinal flushing problems. Prior to AOD, Tank Rooms 3 and 8 were manually operated by the contractor due to defective valves. The valves are used to regulate water flow. This would not have caused any problems with the supply of potable water. However, on AOD, airport security measures were implemented and the contractor's personnel were denied access to the tank rooms. The tanks became empty and no potable water was supplied to the northern part of the East Hall, the North Concourse, West Hall, North West Concourse, and South West Concourse. The low water level alarm did not activate because the Building Management System, which was considered not to be an airport operational readiness required function, was still not operational. On 7 and 8 July, there was no potable and flushing water in the toilets and some tenant areas in the southeast side of PTB. These toilets were served by Tank Room 2, which was flooded. For safety reasons, the electrical control panel which operated the pumps was switched off causing interruption to the water supply. Water supply was restored by 8 July. Even before AOD, the plumbing contractor reported problems with urinals due to (a) flow of flushing water, (b) problem with sensors, (c) blockage of urinals, and (d) cleanliness of toilets. In particular, the urinal problems included accumulation of sediment in the valves, improper setting of sensors, accumulation of rubbish due to public misuse and the low level of cleanliness of toilets. Sediment in water supply is an airport maintenance problem. Malfunctioning due to improper setting of sensors is a workmanship issue. Rubbish in urinals due to public misuse is common in a busy airport. Cleanliness of toilets is a janitorial operation issue. By October 1998, rectification to the flushing system for the toilets were made and generally, very substantial improvements have been achieved.

8.21 [18] Toilets too small. On AOD, people needed to queue up for toilets. Apart from the many visitors whose number was beyond the expectation of AA, there were many passengers who were stranded by the late flight departures, and meeters and greeters who were affected by the late arrivals. The washroom services were therefore very much stretched. The philosophy of the toilet design can be explained due to large size of PTB. Smaller toilet blocks were built and scattered at reasonable distance so that those who wish to use them would be able to find one in the near distance. If large toilet blocks had been built, they would have been a long distance apart and therefore difficult to find as space is a valuable commercial asset in PTB. The area of the toilets was also not designed to be large enough to accommodate baggage carts. This was also not an issue in the airside departures area and the pre-immigration area on arrival as no baggage cart is provided in these places. For other areas, it was assessed that only passengers travelling alone would have no one to look after their baggage on carts while using the toilet. But such passengers could use the toilets after they checked in their luggage, or before they retrieved their luggage from the reclaim belt. If they really needed to bring in a baggage cart, then they could use the toilets for the disabled which were large enough. Although small toilets do cause some inconvenience to this particular kind of passengers, the Commissioners accept the design as being reasonable in the circumstances, especially taking into account the many toilet blocks that scattered not too far away from each other which would convenience most passengers. There were some complaints about the size of the toilet cubicles, especially those for ladies. W43 Mr Douglas Edwin Oakervee explained that the 150-mm wide ledge over the cistern at the back of the toilet could be used to keep one’s hand luggage. The small inconvenience caused by the small sizes of the toilets and the cubicles is considered to be minor.

8.22 [19] Insufficient water, electricity and staff at restaurants. *Water supply*: the discussion for lack of potable water in toilets under items [15] and [16] above are also applicable for restaurants in the new airport. *Electricity supply*: there were electrical outages for short periods of time as tenant contractors switched off power to perform their work, and by tripping of circuit breakers due to faulty tenant work. AA also had to disrupt power supply to increase capacity of power distribution system due to unanticipated electrical power load from tenants. *Staffing problems*: services in restaurants were unsatisfactory due to shortage of staff to handle the volume of business. For landside restaurants, the surge of visitors during the first week of airport opening taxed the facilities beyond expectations. For airside restaurants, some employees did not obtain security passes in time to allow them to report to work. The problem was further compounded by the inexperience and the unfamiliarity of the new workers with the new environment. These problems occasionally caused inconvenience to users for about a week since AOD.

8.23 [20] Rats. In the middle of August 1998, during the course of the Commission's inquiry, it was reported by the media that there were rats pestering the new airport, sometimes even causing damage to electric cables by their nipping, and some newspapers accentuated the problem by using out the vernacular name of "Rat Island" to describe CLK. AA had in fact commissioned pest control in early May 1998, and rats should not therefore be a problem of great concern.

8.24 [21] Emergency services failing to attend to a worker nearly falling into a manhole while working in PTB on 12 August 1998, [22] Traffic accident on 28 August 1998 involving a fire engine, resulting in five firemen being injured; [23] A maintenance worker of HAECO slipped on the stairs inside the cabin of a Cathay Pacific aircraft on 3 September 1998; [24] A power cut occurring on 8 September 1998, trapping passengers in lifts and on the APM as well as delaying two flights; and [25] Missed approach by China Eastern Airlines flight MU503 on 1 October 1998. These problems are treated as minor because each of them was an isolated incident or accident involving one person or only a few people, with effect neither extensive nor widespread, and the evidence does not point to any operational problem of the new airport. The details about them can be found in Chapter 9.

8.25 Out of all the problems identified, only the above 25 items are considered to be teething or minor. More details of their causes and the party responsible are provided in Chapters 9 and 16. The most serious problems that were pervasive in relation to the operation of the new airport were the inefficiency or unreliable working of FIDS, together with the malfunctioning of monitors and liquid crystal display ("LCD") boards which were to display flight information, the breakdown of cargo handling by Hong Kong Air Cargo Terminal Limited, which eventually imposed an embargo on most import and export cargo, and the chaos in baggage handling including the malfunctioning of monitors and LCD boards in the baggage reclaim area. These three items were closely connected with the delay in flight departure and arrival, confusion over parking of planes, late arrival of tarmac buses causing delay in disembarking passengers, insufficient ramp handling services and miscommunication amongst staff handling the same. The three items were therefore treated as deserving the greatest attention of the Commission and its counsel, as each of them caused great financial loss to various sectors of the Hong Kong business community, or created serious inconvenience to passengers using the new airport, or severely affected the reputation of Hong Kong. They are therefore classified as **major problems**.

8.26 All other problems that are not major or minor are classified as moderate in accordance with the criteria set in paragraph 8.7 above. Some of these moderate problems are so categorised because they could have serious consequences in risking personal safety or safety of aircraft, such as the malfunctioning of Aircraft Parking Aid, fire engines driving on the tarmac crossing the path of an arriving aircraft and an arriving passenger suffering from heart attack not being sent to hospital expeditiously. Others relate to the important aspect of security of the new airport. Fortunately, these problems only occurred once, and no life or security was jeopardised. All these problems, save a few of them, did not last long as remedial measures were taken to resolve or rectify them, otherwise the consequences would have been serious. Some problems are included in this category because they affected an extensive class of airport users or they lasted for a considerable time. **Moderate problems** are set out below:

[26] Delay in flight arrival and departure
[27] Malfunctioning of ACS
[28] Airside security risks
[29] Congestion of vehicular traffic and passenger traffic

[30] Insufficient air-conditioning in PTB
[31] Public Address System ("PA") malfunctioning
[32] Insufficient staff canteens
[33] Radio frequency interference ("RFI") on air traffic control frequency
[34] Aircraft Parking Aid malfunctioning: including a Cathay Pacific aircraft was damaged when hitting a passenger jetway during parking on 15 July 1998
[35] An arriving passenger suffering from heart attack not being sent to hospital expeditiously on 11 August 1998
[36] Fire engines driving on the tarmac crossed the path of an arriving aircraft on 25 August 1998
[37] HAS tractor crashed into a light goods vehicle, injuring five persons on 6 September 1998
[38] Tyre burst of United Arab Emirates cargo flight EK9881 and runway closures on 12 October 1998
[39] Power outage of ST1 due to the collapse of ceiling suspended bus-bars on 15 October 1998

8.27 [26] Flight delays. There were significant delays in both incoming and outgoing flights on AOD and the next few days. Their pervasiveness and magnitude disqualify them from being teething problems. On AOD, there were 213 incoming flights. 51% of them arrived early or on time when not taking into account of the holding time of aircraft on the taxiway. Of all the incoming flights, 7% was delayed within 15 minutes, 23% within 30 minutes, 36% within 60 minutes and 13% more than 60 minutes. The average delay was 24 minutes. There were 207 outgoing flights, and all were delayed. 3% of them were delayed within 30 minutes, 13% within 60 minutes and 87% more than 60 minutes. The average delay for all departure flights was 2.63 hours. On 7 July 1998, 62% of outgoing flights was delayed more than 60 minutes. However, these delays were not problems in themselves. Rather, they were the results and consequences of other problems such as the inefficiency of FIDS, difficulties in baggage handling, and malfunctioning of the airbridges and ACS etc. Such lengthy delays are normally beyond the expectation of passengers, and obviously affected a large number of passengers, causing them inconvenience and anxiety.

8.28 [27] Malfunctioning of ACS. The most serious impact to the public were incidents of arriving passengers not being able to enter or exit to and from terminals. There were altogether five incidents of arriving passengers not being able to exit the airbridges leading from the plane door to PTB, apparently all due to the malfunctioning of the ACS. The ACS was to control access to the airbridge so that only authorised personnel with a swipe card can open the door between the airbridge and the Arrivals or Departures Hall in PTB. The malfunction rendered the swipe card useless in opening the doors. Other malfunctioning of doors caused significant inconvenience to AA and tenant employees. Total incidents reported: 44 in the first week from AOD, 29 the second week, 48 the third week, and 57 the fourth week. Although security guards and airport personnel were posted to operate doors manually so that no public safety was compromised, problems remained more than a month after AOD, and the incident trend line showed no sign of diminishing occurrences from AOD to end of July. The efficiency and productivity of the airport staff and tenant employees were impacted when doors malfunctioned, thus exacerbating other problems by prolonging the response time. Due to the fact that security guards were posted immediately to manually operate the doors affected until defective parts were replaced and the doors tested, this problem is bordering on minor and even teething, but for the fact that ACS was still not fully completed and tested at the time of the hearing. Moreover, the ACS problem was linked with other airside security problems, such as 90 transit passengers of China Airlines Ltd. being allowed to enter the Departures Hall without security check, and 55 cases of unauthorised access to the restricted area between 6 July and 17 October 1998. Had ACS been properly functioning, these other security problems would probably not have occurred, albeit they did not pose real security risks. This is the main reason why ACS is considered to be a moderate problem.

8.29 [28] Airside security risks. On 10 July, police motorcycles sought entry into a security restricted area in response to a traffic accident with two workers slightly injured. Two ambulances were allowed entry into the restricted area but not the police motorcycles. The security staff followed established procedures in denying access for a non-emergency vehicle which had no permit. The police motorcycles had no permit and could not be considered as emergency vehicles since they had no siren nor flashing lights. Whilst it can be said that security procedures were followed, there may be issues of ambiguity in these procedures and miscommunication between the relevant authorities. On 25 July, airline staff took some 90 transit passengers from the aircraft to Departures Hall directly, without security screening. This was a violation of procedures for screening transit passengers. W51 Yuen states that in the imperfect world of airport security, this type of human error does happen occasionally without fanfare. However, if the ACS had been functioning properly, the door between the aircraft apron and the Departures Hall would be locked, preventing access to the transit passengers. Between 6 July and 17 October 1998, there were 55 reported cases of unauthorised access to the Airport Restricted Areas. The vast majority of these cases involved staff failing to bring permits, failing to display them, or using colleagues' permits for convenience. On 8 July, a KLM Royal Dutch Airlines ("KLM") flight departed with the baggage of two passengers who were not on board. During the boarding process, it was discovered that the equipment used to scan boarding passes was not working properly and manual collection and checking had to be carried out. It became apparent later that some passengers were missing and the cabin crew conducted a passenger head count, which turned out to be equivalent to the final number of passengers checked-in. At this time, the flight was already an hour behind schedule. Subsequently two passengers showed up at the boarding gate when all doors had already been closed. It was not until then that the boarding staff realised that the headcount was inaccurate. This incident was investigated by Civil Aviation Department which found that KLM had breached aviation security requirement by not ensuring that the relevant baggage was removed.

8.30 [29] Congestion of vehicular traffic and passenger traffic. The traffic congestion on the roadways around PTB and passenger congestion in PTB were caused mainly by the unexpectedly large number of visitors, the non-completion of paving construction works and confusion among passengers inside PTB on AOD. W51 Yuen states that extraordinary increase in traffic on opening of major airport facilities is a common occurrence due to drivers circulating the roadways to find their destination. The problems were resolved when visitors subsided, additional signs installed, paving works completed and better traffic management implemented. However better traffic planning would have had kept the problems at bay. Although the period affected was not too long, the problem caused inconvenience to a large number of people and it is therefore considered to be a moderate problem.

8.31 [30] Insufficient air-conditioning in PTB. There were a number of incidents of air-conditioning failure inside PTB, with the duration and cause, according to AA, set out below:

Duration	Cause
4 hrs, 6 July	Shutdown of one to three operating chillers due to reasons such as defective flow switch and low pressure switch fault (see **Appendix VIII** for a diagrammatic presentation of events)
30 min, 10 July	one of three chillers shut down due to insufficient water flow caused by operator error
2.5 hrs, 12 July	two of four chillers shut down due to operator error
7-9 hrs, 13 July	all four chillers shut down due to lightning strike
45 minutes to 2.5 hrs, 28 Aug	all chillers tripped off due to lightning strike affecting the power supply; first chiller resumed within 45 minutes and remaining chillers resumed within 2.5 hours
1.3 to 3.3 hrs, 29 Aug	all chillers tripped off due to loss of sea water supply; first chiller resumed within 1 hour 20 minutes and remaining chillers resumed within 3 hours 20 minutes

45 minutes to 2.75 hrs, 30 Aug	all chillers tripped off due to lightning strike; first chiller resumed within 45 minutes and remaining chillers resumed within 2 hours 45 minutes
1 hr, 8 Sept	all chillers tripped off due to power failure caused by tripping of circuit breakers; all chillers resumed in an hour
4 hrs, 14 Sept	all chillers tripped off due to human error while another contractor carried out testing on another system; all chillers resumed within 4 hours
2 hrs, 12 Oct	all chillers tripped off due to China Light & Power Company Limited system disturbance causing the tripping of the air handling units and the chillers; all chillers resumed in over 2 hours
1 hour 10 mins, 28 Nov	all chillers tripped off due to loss of sea water supply; all chillers resumed progressively over 1 hour 10 mins

The not infrequent tripping of the chillers in PTB and the importance of air-conditioning in Hong Kong especially during the summer months render the problem more than minor. W51 Yuen opines that aside from the chiller outages, the public's perception that air conditioning was inadequate could have been a result of the system's design temperature of 24^{o}C instead of a more acceptable 22^{o}C. Passengers in airport terminals generally prefer a slightly cooler temperature than normal due to walking and luggage toting activities. There were also incidents of no or insufficient air-conditioning in some tenants' premises. The inadequate air-conditioning in tenant areas was caused by miscalculation and poor co-ordination of tenant construction works. Some tenant contractors' fit out work was behind schedule for AOD. This delay, in turn, caused late applications for chilled water connections and compressed the workload of AA's air-conditioning contractor just prior to AOD. There were also faulty works by the tenant contractors which caused delays in supplying the chilled water. The problem lasted from AOD to around 13 July.

8.32 [31] PA malfunctioning. PA consists of Central PA and Local PA, the definitions of which can be found in paragraph 12.135 of Chapter 12. On AOD, central PA was down twice. On 7 July 1998, it was down for six times including one which lasted 2 hours and 5 minutes. On 8 July 1998, five occurrences of downtime were experienced. Local PA was more unstable than Central PA. During the first week of operations, 26 gate rooms experienced problems with Local PA. There were 21 reports of Local PA problems in various zones in the second week, 25 in the third week, and 122 in the fourth week. Intermittent problems of local zone PA consoles continued beyond the last week September. Problem logs from 4 August to 20 September show numerous local PA problems occurring virtually daily in a random fashion. When Local PA fails, Central PA can take up its function. However, since AOD even Central PA had failed from time to time. Although some reported problems were caused by operators' errors, most were due to the malfunctioning of PA (equipment damage or system fault). A meeting was held ten days after AOD to develop programme for completion of outstanding work. Site acceptance tests of PA were not completed until the end of October 1998. There was also an inherent problem with the acoustics of PA. Even when the system was functioning, the barrel vault ceiling structure caused echoes which reduced the clarity of the announcement. W51 Yuen opines that boarding instructions at gate rooms are basic requirements for airport operations. From an airport and airlines operational point of view, any problem with such system should not be allowed to continue for over a month. This would normally be a minor problem but for the fact that FIDS was not working properly on AOD, and there were a number of gate changes. The malfunctioning of PA aggravated the already chaotic situation.

8.33 [32] Insufficient staff canteens. The new airport has a working population of about 44,629, with about 14,600 people working daily in PTB. Some employees had to wait more than 40 minutes for food and table. For the first two weeks of airport opening, only one canteen with a seating capacity of 250 was in operation. A second canteen opened on 14 July, and the third on 29 July, with the total capacity being about 800. Another canteen opened on 15 October, increasing the total capacity to 954 people. W51 Yuen opines that the ratio of the number of workers to canteen seats vary from airport to airport depending on the eating habits of the workers (purchasing food versus bringing their own). However, the ratio of about 15 to 1 (assuming 14,600 in the main shift to 954 seats) appears very low. If, for example, half the workers do not bring their meals, there would be over two workers per seat at the same time, even if it is assumed that they stagger their meal breaks in three periods. Since food prices in airport public restaurants are higher than normal, workers are not expected to use them every day. Facilities planning for airports should take into account the needs of the passengers, visitors, as well as the employees serving these passengers and visitors. As a large number of people working at the new airport are affected, this problem is classified as moderate. AA has given evidence that improvements are being planned to build more meal facilities for staff.

8.34 [33] RFI on air traffic control ("ATC") frequency. Problems with RFI on the Very High Frequency radio communication channels of the ATC were reported as far back as late 1994. The sources of RFI were in the form of spurious signals originated from some unknown paging stations along the coastal areas in the Guangdong Province. Hong Kong Government has raised this issue with the relevant Mainland authorities since December 1994. Since then, remedial measures have been taken by Hong Kong and the relevant Mainland authorities. To address the problem, affected frequencies were replaced and six additional frequencies were used by ATC as extra backup to further safeguard flight safety since 1996. With the spare frequencies available, air traffic operations at the new airport have not been affected. This is an important matter for air traffic safety and it explains why the problems is classified as moderate.

8.35 Problems [34], [35], [36], [37], [38] and [39] are mainly isolated occurrences. While item [39] will be dealt with in paragraph 11.15 of Chapter 11, the remaining items are dealt with in Chapters 12 and 15. All these problems are not considered to be minor because they either involved injuries to several people or related to areas of importance such as the safe operation and security of the new airport.

CHAPTER 9

TEETHING AND MINOR PROBLEMS AND REMEDIAL MEASURES

9.l Chapter 8 sets out briefly the problems which the Commissioners regard as minor or teething. This chapter deals with each of these problems in detail, outlining their causes and remedial measures. The responsibility for each of these teething and minor problems is reviewed in Chapter 16.

[1] Mobile Phone Service Not Satisfactory

9.2 Mobile phone services play an important role in the communications system for the new airport. Unfortunately, services were plagued by network problems on the airport opening day ("AOD"), causing difficulties to airport operators and inconvenience to passengers and the public using the airport.

9.3 There are 11 mobile phone networks sharing the use of a Common Antenna System ("CAS") inside the Passenger Terminal Building ("PTB"). SmarTone Mobile Communications Limited ("SmarTone") installed the CAS, while individual mobile phone operators designed and installed their own equipment to deliver their respective service. According to SmarTone, the CAS was designed to cover the public area and the VIP Suite of PTB. The CAS was commissioned for about two weeks and accepted by participating mobile phone operators before AOD. Each operator was responsible for using and monitoring capacity of its own equipment. The responsibility of the Airport Authority ("AA") was to ensure completion of the physical installation of the antenna system.

9.4 According to AA, some mobile phone users in PTB continually received busy signals because a number of networks were overloaded on AOD. The peak period of the problem occurred on AOD when flights were delayed, airlines, ramp handling operators ("RHOs") and other operators were having difficulties getting flight information and there was chaos in baggage handling. As the situation improved after AOD and more channels were added to the network, mobile phones services quickly returned to normal.

9.5 The extent of overloading of a mobile phone network is measured by the blocking rate, which indicates the unsuccessful rate of incoming and outgoing mobile phone calls for each sector cell of the antenna network during a certain period. SmarTone admitted that its own mobile phone network had a high blocking rate on AOD. While a blocking rate of 5% is acceptable by industry standards, the design guideline of SmarTone's system provides for a blocking rate of less than 2%. The blocking rate on AOD was as high as 79.9%, falling to 4.7% on 7 July and to 0.35% on 8 July 1998. SmarTone argued that the rapid fall in the blocking rate showed that the SmarTone system was designed to cater only for a reasonable volume of mobile communication traffic in PTB. This argument is not entirely correct. According to the statement of Mr Alan MOK Kai Chau, Senior Manager, Radio Network Engineering Department of SmarTone, SmarTone increased the number of channels in the CAS in a bid to ease the problem on 7 July 1998. The overloading of communication channels were unexpected, resulting directly from the high number of mobile phone call attempts made on the day. SmarTone pointed out that the high usage of the mobile phone system was due to the large number of stranded passengers in PTB and the fact that many public telephones in PTB were not in service at that time. This accords with the facts found by the Commission.

9.6 Hutchison Telecommunications (Hong Kong) Ltd ("Hutchison") operates three mobile phone networks at the new airport and experienced similar problems on AOD. Hutchison's system was launched on 22 June 1998. According to Mr Edmund SIN Wai Man of Hutchison, overloading problems were experienced on the Global System for Mobile Telecommunications ("GSM") network. Records from

Hutchison's traffic statistics database show that the relevant cells of the GSM network had blocking rates of between 5% and 16%. Hutchison also attributed the problem to the sharp upsurge in call traffic which increased from 38% on 5 July to 136% on 6 July and 148% on 7 July 1998. To address the problem, Hutchison added a total of 83 channels to its base stations for the GSM network on 7 July 1998. An additional base station was also installed at the Chek Lap Kok ("CLK") telephone exchange. These measures successfully alleviated the overloading and no problem with Hutchison's networks was reported after 7 July 1998.

9.7 Hong Kong Telecom CSL Limited ("HKT") experienced similar overloading problems on AOD with its GSM network, one of the two networks it operates at the new airport. The average blocking rate for Cell Code NAA2 was recorded as 6.67% on AOD. According to HKT, the initial capacity of its network within PTB was 244 voice circuits, more than three times the service capacity at Kai Tak. To cater for expansion, HKT also installed hardware to provide 24 additional voice circuits for operation by year 2001. On AOD, HKT commissioned 89% of its allocated capacity on the CAS. Around midnight on AOD, in view of the unprecedented levels of use, HKT reconfigured its network, utilizing the remaining reserve voice circuits to increase network capacity. HKT stressed that the problem on AOD was one-off event and no problems were experienced with its networks since then.

9.8 Information has also been sought from the three other mobile phone operators, New World Telephone Limited ("NWT"), Peoples Telephone Company Limited and Mandarin Communications Limited (trading as Sunday). In their responses, all the companies replied that they had not encountered any overloading on AOD. To cater for potential growth in traffic, NWT requested SmarTone on 13 July 1998 for system expansion.

[2] Trunk Mobile Radio ("TMR") Service Not Satisfactory

9.9 The TMR system is an important and essential communication means for many airport operators at the new airport. The evidence shows that users experienced problems with the system on AOD and for a while afterwards. These problems exacerbated the chaotic situation at the airport during its initial period of operation.

9.10 AA has its own TMR system for use at the new airport. There are two other operators providing TMR services for airport operators at PTB, China Motion United Telecom Limited ("CMT") and Hutchison. CMT was the contractor for installing and maintaining the TMR Distributed Antenna Network inside PTB. The network is used by CMT and Hutchison to provide TMR services to their respective users. In order to provide services to its users, each operator was required to:

(a) provide indoor radio coverage in PTB by connecting its own TMR base station(s) to the TMR Distributed Antenna Network ;

(b) provide outdoor radio coverage on the air field; and

(c) provide a switching or linking feature in its system to facilitate communication between users served by the indoor antennae and users served by the outdoor antennae.

9.11 Each TMR operator is also responsible for the capacity and maintenance of its own equipment. According to CMT, the TMR Distributed Antenna Network was installed and commissioned before AOD. Coverage, channel efficiency and reliability of the system were tested and found to conform to standards specified in the contract. Airport users and operators also tested the TMR network during the Airport Trials and the test outcome was satisfactory.

9.12 On AOD, problems were reported with the use of both Hutchison and CMT TMR systems, but not with the AA system. AA submitted that airlines and RHOs using Hutchison's system had difficulties receiving signals while working inside airline offices in PTB and on the ramp on and shortly after AOD. The problem peaked in the first few days of airport opening when a large number of people were using TMR at the same time. No such problem was reported on the CMT system. According to CMT, the only problem with its TMR system on AOD was congestion caused by unfamiliarity of users with the operation of radios. By adding more channel capacity to its repeater network and re-tuning radios to different repeaters, CMT solved the congestion problem within four hours on AOD. CMT also arranged for its Customer Service Team to provide its users with further training on radio operation. It stressed that the entire problem was resolved within one day and no official complaint had been received since then.

9.13 Hutchison acknowledged that some of its users experienced delay in obtaining a channel for communication on its TMR system on AOD. The problem was due to an upsurge in the usage of TMR communication resulting from the abnormal situation at the new airport on AOD. According to Mr Edmund SIN Wai Man, Director of Engineering of Hutchison, the system had not been designed to cope with the huge volume of traffic encountered on AOD. Despite severe overloading, the system operated in accordance with its specification and did not break down. Complaints received by Hutchison related mainly to shortage of channels, coverage problems, patchy signal and poor reception in certain parts of the new airport. To overcome these problems, Hutchison installed additional channels at the new airport and overloading was substantially reduced by 9 July 1998.

9.14 There were also reported problems of coverage and patchy signals such as in the Baggage Hall, on the apron outside SuperTerminal ("ST1") and in landside offices at Levels 5 and 6. According to Mr Sin, AA planned to build one or two antenna farms within the airport perimeter to house all external antennae of TMR operators. However, the proposed antenna farms were not available on AOD and Hutchison had to locate its main base station at Fu Tung Estate, Tung Chung, about 3 kilometres away from the perimeter of the airport. Hutchison had explored the possibility of locating the station on the roof of the Cathay Pacific Catering Services ("CPCS") Building but AA did not accept the proposal. As pointed out by Hong Kong Airport Services Ltd. ("HAS"), the signals transmitted from the Tung Chung base station were slightly weak and their strength was further dissipated by buildings around the perimeter of the new airport. While Mr Sin stressed in his statement that coverage from the Tung Chung base station over various outdoor locations of the new airport including the apron was tested by Hutchison on 7 May 1998 with satisfactory results, he attributed the problem of patchy signal on parts of the apron outside ST1 to the location of the base station and commented that if Hutchison had been able to locate the base station within the perimeter of the new airport, the problem would not have existed.

9.15 The Baggage Hall was supposed to be covered by a common antenna system in PTB, which is an internal antenna system, can enhance coverage in large buildings and is linked with Hutchison's Tung Chung base station. However, on AOD, the common antenna system for Hutchison's TMR system was out of action because of a problem with the link between the common antenna system and the Tung Chung base station. Accordingly, Hutchison's TMR users had to rely on the Tung Chung base station which produced a slightly weaker signal. The link between the Tung Chung base station and the common antenna system was put into operation on 29 July 1998.

9.16 In the light of the problems on AOD, Hutchison installed a new base station with seven more channels in PTB on AOD, four channels on Day Two and three more on 14 July 1998 which improved TMR coverage at the Baggage Hall. Hutchison also put in place another temporary base station on the roof of ST1 to enhance signal transmission and added seven repeaters and 30 antennae to improve the coverage on Levels 5 and 6 landside offices. RHOs and other operators of the airport community were able to use the system about a week after AOD.

[3] Public Telephones Not Working

9.17 There are about 400 public phones in PTB supplied by NWT. International Computers Limited ("ICL") is AA's contractor for the cabling work in PTB, including that for public telephones.

9.18 As at AOD, NWT installed 365 public phones consisting of 291 powerphones, 31 conventional phones and 43 courtesy phones. A total of 150 public phones were operational on AOD. Of powerphones and conventional phones, only 118 (about 30%), and of courtesy phones, only 32 were operational on AOD:

Type	**Number in operation on AOD**
Powerphones	111 (about 26 of which could only make local calls)
Conventional phones	7
Courtesy phones	32
Total	150

9.19 Of the public phones that were functioning, some had operational problems. AA and NWT presented different versions of the extent of the problems, which are summarised as follows:

Problem	**Number (According to AA)**	**Number (According to NWT)**
Coins not being accepted	8 powerphones	4 powerphones
No IDD services available	27 powerphones	26 powerphones
Long wait before second call could be made	Approx. 5 conventional phones	Common in conventional phones
Poor quality of reception	Some powerphones	None
Hardware problems	Some powerphones	None

Phones drawing too much current and tripped power circuits	Approx. 5 powerphones	16 power phones

9.20 The main reason for the low number of public phones in use on AOD was the incomplete and poor cabling and jumpering work in the communications rooms. In normal circumstances, the lack of telephones in PTB would have caused some inconvenience and waiting time to users. However, on AOD, there was an unexpectedly high demand for public phones due to flight delays, baggage reclaim delays, overloading of mobile phone networks, and the influx of a large number of sightseers to the airport. The increased demand coupled with the unavailability of a large number of public phones, despite having been installed, caused serious inconvenience to the public, particularly in the light of the chaos caused by the lack of flight information on AOD.

9.21 Before AOD, AA had instructed other contractors to carry out the cabling and jumpering work that ICL was supposed to do. Although the bulk of the work was completed before AOD, some work was outstanding. Due to the delay in the completion of cabling and jumpering, there was insufficient time to test the cabling circuits and NWT's payphone network.

9.22 Signs were put up on the payphones indicating that they did not work. Despite this, members of the public tried to use them which meant that the inoperative phones had to be covered completely. The number of phones in operation increased rapidly from 150 on AOD to 329 on 20 July, 377 on 25 July and 382 on 3 August 1998. As flight information display improved and more channels were added to the mobile phone networks, the inconvenience caused by the unavailability of public phones was significantly reduced by mid-July.

[4] Escalators Breaking Down Repeatedly

9.23 Some users were annoyed by the escalators in PTB breaking down repeatedly. The escalators were designed and installed by

Constructions Industrielles De La Mediterranee SA ("CNIM"). According to AA, the escalators are of public service grade which is the same standard as those used by Mass Transit Railway Corporation ("MTRC") in numerous stations throughout Hong Kong.

9.24 Of the 61 escalators installed within PTB and the Ground Transportation Centre ("GTC"), 59 were in service on AOD. There were 20 and 19 escalator stoppages recorded respectively on that day and the day after. The stoppages were mainly caused by the escalators' protective devices being set at a high sensitivity level.

9.25 The New Airport Projects Co-ordination Office ("NAPCO") identified the cause of the malfunction as being the tripping of overload switches. The threshold of the overload switches were set too low for full passenger loads on the escalators. When these were geared to a higher load setting, the problem was resolved. While testing and commissioning of the escalators had taken place, and most of the escalators had been used in the various airport trials, the low overload settings had not been picked up for a fully functioning airport load situation.

9.26 Mr Robert John Fluhr, General Manager of the Maintenance Services Department of AA, said in his witness statement that on AOD, as he walked around with one of his managers, a number of the escalators and travellators were not working. The two managers discovered that the switches had tripped, and further investigation established that this was due to the over sensitivity of the overload safety mechanism. After CNIM had adjusted the setting of this overload mechanism, the problem disappeared.

9.27 Mr WONG Yiu Fai, Manager of Building and Systems Maintenance of AA, stated in his witness statement that because the exact loading of the facility was unknown before the actual opening of the airport, a certain amount of commissioning was necessary for a few days before the optimum level was found which both protected the facility from damage and did not result in unnecessary stoppages. It was therefore difficult for the installation contractor to set the sensitivity level correctly for AOD. CNIM submitted that it was normal to adjust the sensitivity of protection devices to a level which allowed normal protection of the customer and that this would be done after the escalator had been put in use. This was done on 8 July 1998.

9.28 Other incidents were caused by people stopping some escalators not in emergency situations and foreign objects jamming the steps. The large number of visitors on AOD had increased the possibility of loose parts being dragged into the combs causing the stoppages. The emergency stop button was pressed, sometimes by accident and sometimes by passengers wishing to walk the other way up or down an escalator.

9.29 On AOD, systems such as the General Building Management System, the Building Services Integration, the Supervisory Control and Data Acquisition, and the Mechanical Building Management System had not been completed. These systems are important to maintenance services for automatic control, performing remote switching and as a monitoring and warning system. Had these systems been available, the breakdown of an escalator would be reported automatically and a maintenance team could be despatched immediately to fix the problem. Due to the unavailability of these systems, maintenance staff relied on regular patrolling to monitor the operation and condition of plant equipment; hence they were not always in a position to take timely corrective actions to prevent the disruption of service, but were busy reacting to complaints and other feedback.

9.30 After the first week of airport opening, the operation of the escalators stabilised. The few stoppages occurring later were mainly due to loose screws from luggage and other foreign objects jamming the steps. This is considered to be part of everyday operation.

[5] Insufficient or Ineffective Signage

9.31 There were complaints that users of PTB were inconvenienced because signage did not provide sufficient information or direction to passengers to ensure smooth and efficient flow through the various facilities. However, AA maintained that the signs in place on AOD were adequate to enable all passengers and other users of PTB to use the building in accordance with the design. According to AA, the concept of a minimal approach to signage was fundamental to the design of the directional signage. Proliferation of commercial signage could also have affected adversely the clarity of signage. The likelihood that signage would be required to undergo change in future also led to the adoption of a system that could economically accommodate modifications. However, W51 Mr Jason G YUEN opined that there is another school of thought that prefers to install signs in between necessary signs as back-up in case the first sign is missed. Most airport operators and users prefer this philosophy.

9.32 According to the witness statement of Mr Mark A. Siladi, the Vice-Chairman of the Board of Airline Representatives, the issue of signage was not dealt with adequately before airport opening. He understood that since AOD, 2,000 to 3,000 extra signs had been provided by AA. He referred specifically to the inadequacies of signage directing users to airline offices on the landside of PTB. It was not until after AOD that AA announced the approved signage for airline offices. W43 Mr Douglas Edwin Oakervee explained at the 67th meeting of the Project Committee that the original design of signage was driven by the more aggressive commercial philosophy in that commercial activities, not necessarily airlines, were key to the airport. The signs had therefore been designed to direct passengers to the commercial areas. This resulted in some areas where the signage for commercial and airport operations were in conflict. W40 Mr Peter LEE, Manager Product Development of Cathay Pacific Airways Limited ("Cathay Pacific"), said that signage to indicate their southern baggage inquiry desk and transfer desk was not adequate. AA refuted allegations of inadequate signage at Cathay Pacific's southern baggage inquiry desk and transfer desk. It stated that transfer signage was put up shortly before AOD and temporary signs were erected before AOD for airline baggage inquiry desks.

9.33 According to NAPCO, they had observed and made specific comments on the signage problem to AA following the various airport trials. In his written statement, Mr Nicholas Trevor Reynolds, Chief Architect of AA, stated that it was difficult to assess the objectivity of responses from participants of the trials on signage. This was because temporary signs used at the trials were different from the proposed permanent signage. AA said that they had directed changes to be made to take account of comments at airport trials. This was confirmed by The Mott Consortium ("Mott"), the contractor for the detailed design of signage in PTB. In his witness statement, Mr Robin Doughty, Commercial Manager for Cevasa Imagen S.A. ("Cevasa Imagen"), AA's contractor for manufacturing the signs, said that AA put in substantial orders for signs as late as May 1998 and kept changing instructions as AOD approached. Some of the signs which AA requested to be installed before AOD were not put up in time. The additional signs it ordered in May 1998 from Cevasa Imagen were not essential for the proper functioning of PTB.

9.34 An unanticipated number of passengers and visitors used the external buses instead of Airbuses and crowded at Cheong Tat Road which led them to Level 3 (ground level) of PTB at the new airport. Due to the unanticipated use of PTB, passengers starting at Level 3 without luggage and visitors were diverted to the Departures Hall through the Arrivals Hall. Unfortunately, the signage was designed to start at the Departures Hall. AA explained that the basic design of the building assumed a 'one-way' flow system with all departing passengers entering the building at the Level 7 Check-in Hall from the Level 8 Departures kerb or the MTRC platform and carparks via the terminal access structure. All arriving passengers were assumed to leave from Level 5 Meeters and Greeters Hall to the trains, buses, taxis, hotel limousines and carparks. This caused some confusion among users of the building under the one-way flow signage system because these passengers presumably saw signs intended for arrival passengers rather than for departure passengers. Mott suggested that as the signs were designed with a logical process related sequence in mind, confusion would arise if people flows were not managed to the intended operational criteria. Apart from unanticipated use for this reason, AA insisted that the large number of people using PTB had done so satisfactorily.

9.35 AA however acknowledged that among the more than 1,500 directional signs within PTB, a single arrow within the Meeters and Greeters Hall pointed in the wrong direction. It alleged this was a mistake on the part of the contractor but it was corrected within one day.

[6] Slippery and Reflective Floor

9.36 The Commissioners have heard complaints about the slipperiness and reflective quality of the polished granite flooring used in PTB. Criticisms center around the Zimbabwe Black granite floors which are allegedly both slippery and very reflective, the latter causing potential embarrassment to female users of the new airport.

9.37 The interior architectural design of PTB was carried out by Mott in its capacity as AA's consultant. The supply and laying of the hard flooring for PTB was completed by Grant Ameristone Limited ("Grant"), nominated sub-contractor selected by AA, the British-Chinese-Japanese Joint Venture ("BCJ") being the main contractor. The materials and the types of surface finish were specified and approved by AA before the sub-contract was awarded. According to AA, it took into consideration factors like durability under heavy traffic load, suitability for pedestrian and trolley use, ease of maintenance as well as aesthetics in the selection of flooring materials. To cater for the heavy pedestrian and wheeled traffic at PTB, natural granite was used and such was consistent with its use in prestigious buildings, both throughout Hong Kong and internationally. Also, to enable floor patterns and borders to break down visually the large expanse of the floors in PTB, a selection of five different types of granite were used and, except for Zimbabwe Black (black) and Rustenberg (dark grey) which had polished surfaces, all the other granite surfaces were honed.

9.38 According to AA's submissions, a total of five incidents of people slipping on floors in the public areas of PTB were recorded between AOD and 31 August 1998. From the records available, a wet floor was identified as a contributing factor in two of these incidents. Furthermore, none of the five reported incidents of slipping occurred on the black granite floors.

9.39 The problem of slippery and reflective floors came up during the first airport trial held on 18 January 1998 when airline staff complained of the slipperiness and the reflective surface of the polished black granite floors. As a result of the feedback, AA carried out a series of tests to measure the slipperiness of all the granite surfaces, both the polished and honed ones and concluded that the polished stone was marginally more slippery. In their witness statements, both Mr David John Corby, Senior Project Manager for PTB, and Mr Nicholas Trevor Reynolds, Chief Architect of AA, claimed that the presence of dust which came from continuing construction and cleaning activities was a factor contributing to the slippery floors. Mr Timothy Graham Stelfox, Head of Contracts of BCJ, also stated in his witness statement that certain parts of the granite floors in the public areas had a highly polished surface finish and, under certain conditions, could possibly be slippery for footwear with particular characteristics. To address this problem, remedial actions were subsequently taken to raise the slip resistance of the polished Zimbabwe Black and Rustenberg surfaces. As a first step, Grant honed the border areas adjacent to check-in desks where passengers would queue in order to reduce the polish effect. Honing which involved grinding the floor surface to make it rougher, however, proved to be extremely time consuming. In an attempt to achieve quick results, AA undertook research into the possibility of applying a non-slip surface coating to the polished floors and eventually decided to carry out the treatment to all the Rustenberg and Zimbabwe Black surfaces. The actual process of surface treatment, which required a dust free environment with no traffic for a period following treatment, began on 1 July 1998 as soon as AA had found a suitable product and the areas concerned had become clear of temporary construction works. The whole operation was completed after AOD and all the floor surfaces so treated meet the standard of the American Society of Testing and Materials for use by disabled persons.

[7] Problems with Cleanliness and Refuse Collection

9.40 Rubbish build-up in some parts of PTB immediately before

AOD and shortly thereafter has been cited as a problem.

9.41 Before looking at the problem, it is useful to first have an understanding of the basic design of the refuse collection system at PTB. The design of the refuse collection system in PTB as part of the terminal building design was carried out by Mott. The design provides for a total of eleven refuse collection rooms at various points around PTB. All refuse rooms are situated adjacent to the ground level lobbies of the goods lifts serving all levels of the building, with access to the adjacent roads. There are also two refuse compactor rooms, one in the western apron area to handle apron waste and the other located at the ground level in the southern concourse. All PTB tenants and their janitorial contractors are required, under the terms of their agreements, to package waste in a clean and hygienic manner and place it in designated containers in the refuse rooms. Pearl Delta WMI Limited ("Pearl"), which has been awarded the contract to provide waste management services at the new airport, is responsible for the transportation of waste from the refuse rooms, both airside and landside, to the two compactor stations and its subsequent removal to the North Lantau Refuse Transfer Station for disposal. In addition, a temporary collection point was established on the landside on AOD to deal with relocation and fitting out waste. AA has engaged two contractors to provide general janitorial services at PTB and their distribution of work is described below:

Contractor	**Scope of service**
Lo's Airport Cleaning Services Limited ("Lo's")	Provision of janitorial services at certain parts of PTB and GTC.
Reliance Airport Cleaning Services Limited ("Reliance")	Provision of janitorial services at some restricted airside areas of the new airport, including the Baggage Hall, some AA offices and some areas at the apron level for ramp staff.

9.42 On AOD and some time thereafter, there was accumulation of construction debris and other rubbish in PTB although, according to

Lo's, the problem did not manifest itself in PTB and GTC apart from the airline offices and the common areas on the 3/F, 5/F and 6/F of the building. As pointed out by Mr Eric WONG Wai Lun, General Manager, Operations Support of AA, the removal of waste, particularly industrial waste generated by the construction and fitting out work and removal operation, was a serious problem in PTB at that time. Tonnes of waste materials were produced each day, all of which needed removal. To deal with the problem, both AA and BCJ, the PTB main contractor, hired additional labour to remove the rubbish. From the submission of AA, it was noted that BCJ's labour force was increased to about 400 day-shift and 150 night-shift workers during the two weeks prior to AOD and, during the same period, an average of approximately 800 cubic meters of rubbish was removed from PTB every day. However, despite the efforts made, it was not possible to remove the considerable volume of industrial waste being constantly generated by the contractors and tenants around that time. According to Mr Wong, construction, removal and stocking activities kept going on from the few days before and the week after AOD and it was almost impossible to prevent the illegal dumping of refuse in public areas. Although both AA and BCJ did mobilise extra cleaners to remove the waste, its build up was too fast to be cleared. As to what caused the problem, the Commissioners find from evidence available that all the following are contributing factors:

(a) failure of PTB tenants to comply with the proper refuse disposal procedures;

(b) deficiency in the design of the refuse collection system in PTB and non-functioning of facilities and equipment;

(c) delay in the issue of access permits or passes to both the workers and vehicles of cleaning contractors;

(d) insufficient co-ordination between AA and its cleaning contractors; and

(e) the presence of stranded passengers and a large number of sightseers.

(a) Failure of PTB tenants to comply with the proper refuse disposal procedures

9.43 The failure of many PTB tenants to comply with the requirements of tenant design guidelines in the disposal of rubbish is perhaps the major cause of the problem. The tenants were late in completing their fitting-out works and, as a result, their relocation exercises started later than anticipated. This eventually led to large overlap of activities that were originally planned to be consecutive and in turn created significant volumes of construction refuse to be removed within a short time. Worse still, these tenants or their contractors did not observe the proper rubbish disposal procedures and simply dumped their rubbish away from their premises instead of removing it to the designated refuse collection points. The same story was reflected in the evidence of W42 Mr NG Ki Sing who confirmed that the reluctance of tenants to take up their premises until the very last minute before AOD had resulted in a large build up of waste all around PTB.

(b) Deficiency in the design of the refuse collection system in PTB and non-functioning of facilities and equipment

9.44 There are a number of design or equipment related factors contributing to the build-up of refuse. These factors are summarised as follows:

(i) The design of the refuse room was not adequate to handle the refuse volume in some areas.

(ii) Refuse chutes between Level 5 and Level 3 are not continuous and waste collected from Level 5 has to be containerised on Level 4 and pushed along a walkway to the chute on Level 4 for unloading. According to Pearl, AA has not contracted out the required transportation service.

(iii) Several restaurants are located at the area on top of the chutes on Level 5 where no refuse room is provided. As a result, the restaurant operators cannot make use of the chutes due to its particular design described in (ii) and simply dump their refuse in the common areas nearby.

(iv) The two compactor stations were not ready for use on AOD and there was no access or power supply to them.

(v) The use of electric tugs to tow waste containers to the compactor stations on the airside was originally proposed by Pearl and accepted. However, permits for the use of the tugs were denied shortly before commencement of operation and, consequently, new equipment and alternative arrangements were put in place.

(vi) The refuse rooms were not ready for use and two temporary areas had to be made available.

(vii) For some unknown reasons, some refuse rooms that were not ready for use were however accessible to the tenants but not Pearl.

(viii) The size of the standard litter bins was too small to cope with the situation on AOD.

9.45 In its submission, Mott refuted the allegation at (i). It stressed that the design of the refuse room was compliant with appropriate standards and had been approved by both AA and the Buildings Department. It further explained that the routing of waste through Level 4 as described in (ii) was determined by the location of concessionaries and the absolute desire of AA to keep the movement of waste totally out of public sight.

(c) Delay in the issue of access permits or passes to both the labour and vehicles of cleaning contractors

9.46 AA acknowledged that there were problems on 8 July 1998 in getting access permits for staff and passes for both workers and vehicles of cleaning contractors to remove rubbish. This eventually led to some build-up of rubbish. As stated in the submission of Lo's, the normal processing time for a permanent permit to restricted areas is three full working days in accordance with the Permit System Manual of the Aviation Security Company Limited ("AVSECO"). Despite this prescribed time frame, it usually took 10 days prior to AOD for an applicant to obtain a permit and the situation was even worse from late June up to end of July 1998 when it took three weeks for the issue of permits. In its written submission, Pearl referred to an incident where some filled waste containers could not be removed because the licence application for vehicular airside access had been denied due to some problems with insurance certificate. The delay in the availability of permits or passes for cleaning labour and vehicles unduly affected not only the number of staff who could be deployed to work but also the planning of cleaning work within the restricted areas. AVSECO, however, submitted that prior to AOD, Lo's had been issued with 309 permits (vis-à-vis 660 applications) for them to fulfil their contractual obligations in the Airport Restricted Area including toilet cleaning. Against the background, it should be noted that there are only 33 public toilets located airside within Airport Restricted Area, or the Departures and Arrivals areas of PTB. The reason that only about half of the permits were issued was due to the failure of the staff of Lo's in turning up for photo-taking and collection of the permits themselves. On AOD, the Permit Office had issued 61 permits to Reliance from a total of 63 permit applications received from it.

(d) <u>Insufficient co-ordination between AA and its cleaning contractors</u>

9.47 From the evidence adduced, it is noted that the co-ordination between AA and its cleaning contractors was insufficient resulting in the failure to provide adequate cleaning service. From the daily log kept by AA, there was an incident in which a job order made to Lo's to clean up the goods lifts at the East Hall and the West Hall as well as the lift lobby areas was not undertaken by the contractor due to difficulties in communication. In a separate incident, Reliance was requested by AA on the night of 5 July 1998 to clean up its contract area before AOD but was unable to complete the job simply because of lack of time.

Moreover, the amount of waste left over was too much for its cleaners to cope with in one night's time. AA also suggested that its refuse removal contractors including Lo's, Reliance and Pearl stuck rigidly to their respective boundaries of work and this added to the problem.

(e) The presence of stranded passengers and a large number of sightseers

9.48 There is also evidence to show that the presence of a large number of airport sightseers shortly after AOD undoubtedly aggravated the problem of rubbish build up. As evident from the submission of Lo's, the malfunctioning of Flight Information Display System ("FIDS") had resulted in an increased number of stranded tourists who consumed food and drink on the spot. This, coupled with the large number of sightseers who used the catering facilities in PTB, created additional pressure on the provision of janitorial services within the building after airport opening.

9.49 The problem of rubbish build up lasted only a few days and by 10 July 1998, all rubbish was substantially cleared. Most of the retail shop tenants have become more considerate in disposing of their own rubbish. Also, as confirmed by Lo's, the permit processing time by AVSECO has returned to normal and there is now sufficient manpower inside the restricted areas to carry out cleaning services.

[8] Automated People Mover ("APM") Stoppages

9.50 Automated People Mover ("APM") is automated shuttle train without a driver which runs along the central concourse of PTB at the basement level. It is designed to carry passengers and staff from the East Hall to the West Hall of PTB providing them with easy access to distant aircraft gates. APM operates in pinched loop modes routing through four stations and with two turnbacks at the extreme ends of the track. Each APM train can carry up to 200 passengers and each single journey takes approximately 90 seconds.

9.51 The APM system was designed, built and installed by the New Hong Kong Airport People Mover System Joint Venture under AA contract C350. The joint venture consists of Sumitomo Corporation and the Mitsubishi Heavy Industries, Ltd. ("MHI"). Except for certain contractual arrangements which fell within the former's responsibility, all actual execution of the contract was the responsibility of MHI. On the operational side, MHI was the contractor under AA contract M008 to operate and maintain APM for a period of three years. The daily performance of the APM contractor was overseen by the Airport Management Division ("AMD") of AA.

9.52 The problems with the operation of the APM during its initial period of airport opening concerned interference to automatic door movement and train stoppages. In one incident, passengers were trapped and unable to leave the train for about 50 minutes.

(a) Train stoppages

9.53 On AOD and for two months after, train stoppages were caused by vehicle door failures, platform door failures or overshooting of trains. The number of occurrences during this period were as follows:

Occurrence	**Frequency: number of times recorded**
Failure of vehicle door	34
Failure of platform door	Several
Train overshooting	2 (1 and 25 August 1998)

MHI admitted that these occurrences were caused by initial failure of equipment, and they decreased as fine-tuning of the system progressed. In projects of a scale similar to that of the APM system, fine-tuning after the start of operations was required to improve operational efficiency and to accommodate actual operating conditions which might not have been exactly simulated or foreseen during the design and testing stage.

9.54 Investigation into the causes of train stoppages revealed that passengers sometimes forced a door open in order to help other people to get on board when the door was closing. This disrupted the closing movement of train doors triggering an alarm from the door control circuit and causing the train to stop. Platform doors failed because of friction of door equipment with surrounding mechanical parts and the failure of local door control circuit. The investigation also concluded that trains overshot their designated stops because of improper contact between the trains' power rails and the power collectors.

9.55 Although MHI stressed that vehicle door failures were mainly caused by passengers forcing doors open, it did put into effect some technical remedial measures. After modifications were made to reduce the sensitivity of the door control circuit, the rate of vehicle door failures was reduced from 0.7 times to zero per day in early September 1998. Adjustment was also made to platform doors to reduce the friction of door equipment and the local door control unit replaced, after which there were no more train stoppages caused by platform door failures.

9.56 To tackle the problem of trains overshooting, MHI has replaced all power collector shoes of trains. The Commissioners, however, note from the submissions of MHI that the problem of stopping was not rectified completely soon after AOD. Since August 1998, there have been further incidents of trains overshooting and, on some occasions, undershooting. The following counter-measures were therefore necessary:

(i) Renewal of the dip switch counters for tyre diameter settings.

(ii) Recording of data on stopping positions, tyre diameters and dip switch counter settings to update counter settings if required.

(iii) Adjustment of the range of dip switch counter setting to allow for bigger tyre diameter.

(iv) Modification of the system software.

Implementation of the above counter-measures is expected to enhance vehicle stopping accuracy.

(b) Trapping of passengers

9.57 On 20 July 1998, one passenger and four airline staff members were trapped inside an APM train and were unable to leave the train for about 50 minutes. Eventually, the passenger missed his flight. According to MHI's submissions, the incident began at around 11:30 pm that day when the group of persons boarded No. 3 train at the West Hall departures platform. The following chronology of events may be useful in understanding the nature of the incident and the remedial actions taken:

Time	**Event**
11:30 pm (20 July 1998)	One Cathay Pacific passenger and four airline staff members boarded, or remained on board, No. 3 train at the West Hall departures station. (Normally, all passengers heading for departure gates should alight at the platform and trains should be cleared before heading for the West turnback. A recorded announcement was made continuously at the station to request passengers to alight. However, for unknown reasons, the group did not take heed of the announcement.)
11:36 pm	No. 3 train was stopped by its Automatic Train Control system while proceeding on the West turnback because the preceding train (No. 2) was stalled at the West Hall arrivals station due to a vehicle door malfunction.

11:53 pm	The APM operator at the Airport Operations Control Centre ("AOCC") received an alarm from No. 3 train indicating that someone had tried to force open the vehicle door. The APM operator at AOCC realised that some passengers were on board No. 3 train and, through the inter-com, advised them to be patient and wait for the assistance of maintenance staff. The APM operator then notified the maintenance staff to go to the West turnback to restore No. 3 train. However, it took longer time than expected for the maintenance staff to reach the scene because the APM operator could not communicate effectively with them. At the same time, MHI was trying to restore the operation of No. 2 train.
11:59 pm	The vehicle door problem of No. 2 train was fixed by MHI. Meanwhile, No. 3 train remained at the West turnback.
12:17 am (21 July 1998)	Despite the APM operator's advice, the passengers on board No. 3 train tried to open the vehicle door by turning the emergency door release valve which set off the "Manual Door Open" alarm.
12:20 am	The APM observed through the closed circuit television ("CCTV") five persons getting out of No. 3 train onto the emergency walkway. At the instruction of the Airport Terminal Deputy Manager, the operator shut down the traction power in the tunnel for the safety of these people.
12:35 am	The five persons were safely escorted to the West Hall departures station through the emergency walkway.

9.58 The five persons on board No. 3 train were not supposed to be there. Measures to prevent people from boarding trains at the West Hall departures platform were not effective in the event. According to MHI, there should have been security staff at the station to ensure that arriving trains were actually cleared and that no one would attempt to get on board. Apparently, this was not the case in the incident. MHI attributed the cause of the delay in maintenance staff arriving to restore the train to the lack of effective TMR equipment provided by AA for MHI's maintenance staff.

9.59 Following the series of disruption of train service, AA has taken measures to provide station attendants at each of the four train platforms to ensure that passengers do not attempt to interfere with the door operation or to board when they should not. These attendants are trained to perform evacuation procedures. Emergency procedures have also been adjusted.

[9] Airport Express ("AE") Ticketing Machine Malfunctioning

[10] AE Delays

9.60 Unlike the Kai Tak airport which was situated in the urban area and was well served by a convenient network of public transport, the new airport rests on an island far away from the urban centres of Hong Kong. To enable the new airport to operate smoothly, safely and efficiently, it is very important to put in place an efficient public transport system to cater for the daily needs of airport users. As a key component of that transport system, the Airport Railway, later known as AE, run by the MTRC was designed to handle 40% of the airport passenger ground traffic. Its efficient operation is vital to the smooth functioning of the airport. This accounted for the Government's reluctance to open the new airport without AE being ready.

9.61 Some problems with the service of AE occurred during the initial period after the new airport was opened. These problems pertained to the breakdown of ticketing machines and disruption of train service.

(a) AE Ticketing Machines

9.62 The coin management system of the AE ticketing machines includes the requirement to accept coins and to give coins as change for tickets purchased with notes or coins. During the bulk loading tests carried out just before AOD, it came to light that the machines had difficulty in accepting high volumes of coins and, after repeated purchases, the machines would go out of service. The problem, however, did not surface in the acceptance tests carried out at the manufacturer's site in the United Kingdom ("UK") or in the test facility established by the responsible contractor of MTRC at its site office in Hong Kong. As soon as the problem was discovered, the contractor briefed the specialists in UK and initiated the necessary investigative work. In parallel, MTRC developed a series of contingency measures to cope with the operations on AOD. The measures included:

(i) The coin management system on all machines was disabled so that they would accept notes only.

(ii) A stock of pre-coded AE single journey and return journey tickets was established for purchase by passengers at the Customer Service Centres at all AE stations.

(iii) Temporary signs were put up to advise passengers of the temporary arrangements.

(iv) Staff were posted to assist passengers in the use of the machines and to provide them with the correct denomination of notes to purchase tickets.

(v) Technical support from the contractor was put in place to ensure the acceptable operation of the machines.

9.63 On AOD when AE was first brought into service, 41 out of the 52 machines were operational. This did not pose any problem since the total number of machines was designed to cater for future growth and their full capacity was not necessary for operational needs on AOD. In fact, in order to maximise the effectiveness of customer support and technical support, some machines were not used due to their location. Although passengers did experience some degree of difficulty with the operation of the machines, this was not entirely a result of the lack of coin acceptance and change giving functions. There were also problems associated with the functionality of the machines and passengers' unfamiliarity with their operation. According to MTRC, the experience was comparable to the introduction of new ticket machines in Mass Transit Railway urban lines stations two years ago.

9.64 The contractor's investigation revealed that the problem was related to the coin identification and validation sub-system and was brought about by the range of parameters of the coins being much greater in actual operation than that used during the development and testing phase. By 8 July 1998, a new software was introduced to all machines to enable them to give coins as change. A further software revision was finalised five days later which allowed the full functionality of the machines to be brought into use progressively throughout the system. By 14 July 1998, the software problems were completely solved and all ticket machines have been working properly since 24 July 1998.

(b) Disruption of train service

9.65 Before AE came into operation on 6 July 1998, the system had undergone a 12-week period of integrated system testing and trial operations. As a result of inspection of the operations towards the end of that period, it was agreed that AE should open for passenger operations on 6 July 1998 at a service interval less than the design capacity for full operation and with the journey time longer than the scheduled time of 23 minutes. This was because of the highly complex nature of integration of the many systems involved and the need to regulate both the Tung Chung Line service and the AE service which operated on the same pair of tracks for the most part of the length of the railway. This effectively meant that the AE service would be run at 12-minute frequencies. Through a press release dated 30 June 1998 and a subsequent one on 4 July 1998, passengers were advised of the possibility of extended journey times and the need to board trains at least two hours before the scheduled flight time. MTRC believed that, with the widespread publicity given, prospective train travellers would be made aware of the initial limitations of services and the impact on them should be minimal. In terms of system readiness, the Commissioners note that during the briefing by MTRC on 16 May 1998, Airport Development Steering Committee was assured that all systems had been substantially tested and there were no major technical issues. MTRC, however, expected that there would be the usual startup problems but they should not impinge on passenger safety. In the first three days of operation, the average journey time to and from the airport was 29 minutes and 90% of all scheduled trips were completed. The Daily Management Report of AA's Landside Operations Department also recorded that in a couple of incidents involving train delays, passengers had to be transferred from one train to another and passenger baggage was late in arriving at the airport. According to the explanation of MTRC, the extended journey time was mainly due to difficulties with the train supervision system and the time had been reduced following fine-tuning of the system in the first week of operation. There was also a problem with train door operations but this had been rectified progressively throughout the train fleet.

9.66 There were minor train service disruptions on 9, 11, 14 and 27 July 1998. The most serious disruption to the AE service occurred at 9:50 am on 23 July 1998 when a train damaged a rail crossing on the track towards the airport due to an error on the part of the train operator. The accident resulted in temporary suspension of the Tung Chung Line and a 20-minute service frequency for AE. The number of passengers affected in the incident was estimated to be about 4,000. Contingency measures such as provision of replacement bussing services were immediately available to deal with the disruption of service. AE resumed full service at 12-minute frequencies at 12:30 pm on the same day.

9.67 In its submissions to the Commission, MTRC accepted the initial failure of AE to meet performance specifications. They argued that the disruption was caused by human error and the problems encountered were minor in terms of either delay or inconvenience and were in the nature of teething problems. Throughout the initial period from AOD, AE was able to operate in a safe, effective and efficient manner. The incident on 23 July 1998 was an isolated event and did not relate to any system-wide or training problem. Both MTRC and its contractor were quick in rectifying the problem and introducing effective and adequate contingency measures to cope with the situation.

9.68 The problem of train delays posed greater inconvenience to passengers to and from the airport. Train delays which were caused mainly by signalling and communication problems could possibly be part of the usual startup problems which can generally be expected for such a large and complex railway system. On 27 July, AE was delayed for 19 minutes due to a signal error. While most of the incidents recorded are minor in nature, the major disruption of service on 23 July 1998 which resulted in damage to the rail was more serious. There might be some truth in MTRC's claim that the accident is only an isolated incident since it has so far not recurred. Taken together, the problem of train delays is a minor one. The problem was largely resolved by the end of the first week after AOD and full functioning of the ticketing machines was back to normal progressively thereafter. MTRC has been able to reduce the problem speedily and professionally and improve the AE service on an incremental basis. During the months of August and September 1998, AE was able to achieve an average service frequency of 10-minute intervals with a 25-minute journey time. 75% of all journeys were actually completed in less than 25 minutes. Starting from October 1998, AE has operated in accordance with the original performance specifications at 8-minute service intervals with a 23-minute journey time. No major incidents of service problems have been reported since early August 1998. The Commissioners find particular comfort in that passenger safety does not seem at any time to have been compromised.

[11] Late Arrival of Tarmac Buses

9.69 At CLK, HAS is the sole franchisee for the provision of airside bus service, commonly known as tarmac buses, for the transportation of passengers and airside staff between PTB and remote stands where the aircraft are located.

9.70 On AOD and Day Two, there was significant delay in the disembarkation of arriving passengers, both at the frontal stands at PTB and at remote stands, some delays lasting for up to 2 hours.

9.71 The delay in disembarking arrival passengers at the frontal stands at PTB docking bays were primarily caused by problems related to the airbridges, which are discussed under item [14] Airbridges Malfunctioning.

9.72 The delay in disembarking arriving passengers at the remote stands was largely due to a combination of factors. Problems with FIDS resulted in inaccurate flight information on the location and status of arriving aircraft being provided which resulted in service providers, including RHOs, having to spend time searching for the aircraft on the apron. The problems relating to the failure of FIDS are discussed in Chapter 10. The problems associated with the TMR used by HAS impeded information flow for the despatch of buses and drivers. The overloading of the mobile phone network made the situation worse. The problems relating to the mobile phones and TMR are detailed under items [1] and [2] above. There was a greater utilisation of remote stands for parking of aircraft due to serious flight delays, particularly for departure flights. This put heavier demand on tarmac buses than would normally be expected. The flight delays and a full apron on occasions created difficulties in co-ordinating boarding gate assignment and the location of aircraft which in turn resulted in increased travelling time for buses due to the longer distance between some Apron Passenger Vehicle lounges in PTB and certain remote stands. On some occasions buses were forced to collect passengers from the south apron bus dock and drive for 25 minutes to the north apron parking bay when it would have only taken a few minutes for north apron passengers to board through the north apron bus dock. The use of buses as boarding lounges reduced the time available for buses to carry out its transporting duties. At the Kai Tak airport passengers were admitted to a holding lounge and were required to wait until there were sufficient passengers to fill the bus. However, the boarding practice at CLK was such that passengers were allowed to board the bus immediately after check-in, resulting in buses having to wait at the bus dock until there were sufficient passengers to fill it. Furthermore, in some cases on AOD and Day Two, passengers arriving at a frontal stand where the airbridge did not work were required to be transported by tarmac buses to PTB.

9.73 AA alleged that there were insufficient bus drivers and tarmac buses for AOD and subsequent days. This was denied by HAS who maintained that they had sufficient resources to service approximately three times the number of scheduled flights. Due to the insufficient number of security cards made available by AA, sometimes arriving passengers and airline staff could not gain admittance to PTB which meant that drivers, who did have security cards, left their buses to open security doors to admit passengers and airline staff to PTB.

9.74 Since AOD, there have been a number of remedial measures taken to improve the efficiency of tarmac bus service. The measures taken in respect of FIDS are described in Chapter 10. HAS subsequently changed its TMR provider. A more reliable flow of flight information has been provided by AA to HAS. AA now faxes HAS allocation charts for remote bay flights at 2:00 am each day which allows HAS to plan its manpower allocation at beginning of the day. This is then updated throughout the day. HAS has recruited additional supervisors and bus drivers and more supervisors have been assigned to monitor passenger volumes and to patrol ramps during peaks. Once the allocation of stands became more orderly, the tarmac bus service significantly improved. By 13 August 1998, bussing operation was able to meet prescribed targets in over 90% of the assignments.

[12] Aircraft Parking Confusion

9.75 Apron Control Centre ("ACC") is responsible for allocating parking stands for aircraft. Through FIDS, flight information including parking stands allocated to aircraft was disseminated to operators of the airport community, including airlines and RHOs. Due to the problem relating to FIDS on AOD and Day Two (see Chapters 10 and 13), ACC's ability to perform timely allocation of parking locations for departing and arriving flights was hampered. Extended stay of aircraft due to delays in flight departures eroded parking capacity and made the allocation task more difficult. According to W23 Alan LAM Tai Chi's evidence, delays of aircraft's departures and arrivals built up quite quickly on AOD and by about 1:00 pm, the apron was full. W28 Anders YUEN Hon Sing's recollection was that by about noon on AOD the apron was full, meaning that all the parking stands were occupied. W29 Mr CHAN Kin Sing, however, testified that there were two periods of full apron, between 12 noon and 5 pm and between 8 pm and 11 pm. Thus incoming planes had to queue along the taxiway and would be directed to go to the first available stand, wherever it might be. Planning of stand allocation was therefore impossible.

9.76 Lack of flight information caused great difficulties in communication among the operators in the airport, such as amongst ACC, AOCC, the airlines and RHOs, etc. This put a strain on their resources. In addition, problems such as the malfunctioning of some airbridges and Access Control System doors, insufficient towing tractors due to the amount of aircraft repositioning required, non-familiarity of push-back procedures by some tractor drivers, pilots not fully familiar with the apron, taxiways and remote stands and so forth also exacerbated the problem.

9.77 AA on the other hand alleged that there was no evidence of any confusion on the part of pilots or aircraft caused by the failure of FIDS, though there was short-lived confusion amongst RHOs during the first few days of the airport opening. It appears from RHOs' evidence that they were able to get back to normal operation by about Day Four.

9.78 On Day Two, a Task Force chaired by W48 Mr Billy LAM Chung Lun, the Deputy Chief Executive Officer of AA, was formed to consider immediate actions to be taken in remedying the situation. The Task Force consisted of senior representatives from AA, the Secretary for

Economic Services, the Director of Civil Aviation and the Director of NAPCO. With the adoption of manual backup procedures to FIDS and stand allocation and improvement measures implemented in passenger, baggage and ramp handling services, significant improvements have been achieved.

[13] Insufficient Ramp Handling Services

9.79 The delay in providing mobile steps for passengers to disembark from aircraft parked at remote stands was similar to that in the provision of tarmac bus service discussed under item [11] above, although all three RHOs, instead of HAS alone, were involved in serving passengers of the airlines with which they had respectively entered into contracts. Problems in disembarking passengers at frontal stands due to malfunctioning airbridges are discussed under item [14] below.

[14] Airbridges Malfunctioning

9.80 An airbridge connects the fixed link bridge, which is part of PTB, and the aircraft parked at the frontal stand bordering PTB. The new airbridges at the new airport are quite different from those previously operated at Kai Tak, and have different operational procedures. The airbridges are operated by RHOs. The airbridges were supplied, installed and commissioned by PT. Bukaka Teknik Utama-RAMP Joint Venture, a nominated subcontractor of BCJ.

9.81 A number of faults were reported on AOD and the days thereafter. On AOD, four out of 74 airbridges were out of service for one to two and a half hours. There were 19, 30, 30, 30 and 34 fault calls from AOD to Day Five respectively. There were a total of 576 fault calls up to end of July. Many of the faults related to auto-leveller failure alarms. There were also problems in extending or retracting the airbridges to and from the aircraft. Other than on AOD, these did not cause significant flight delays. To deal with the operational problems, two airbridge teams were formed on Day Three by AA and the contractor to restore service promptly. Service was restored quickly, usually in no more than five minutes.

9.82 The auto-leveller adjusts the height of an airbridge so that it follows an aircraft's movements during loading and unloading. The airbridge is raised and lowered by a vertical drive control circuit. The unusually high number of auto-leveller failure alarms (resulting in stoppage of the airbridge) was caused by the incorrect sequence of a timing element in the canopy deployment safety circuit which had been mistakenly included in the vertical drive control circuit. In servicing a wide bodied aircraft such as a B747, the canopy deployment safety circuit timer did not have enough time to satisfy programme requirements and the electrical power to the vertical drive automatic control was interrupted. The auto-leveller recognised this as a runaway and for safety reason, sounded an alarm.

9.83 The incorrect sequencing was caused by a programming error in one out of approximately 25,000 lines of programming codes. The software error was identified on 11 July 1998 and solved on the following day. Refresher training was also provided to RHO staff.

9.84 AA required all airbridge operators to be certified and stipulated that an operator could only operate an airbridge by himself after he had operated under supervision for more than 50 flights. It has been suggested that some of the delays to the disembarkation of passengers might have been caused by RHO staff not being experienced or well trained to operate the airbridges. HAS alleged that its staff were not given sufficient access to the airbridges at the new airport for training and had to practice on crude simulations, such as the use of an iron bar as an aircraft. Notwithstanding the allegation, when the RHOs' representatives gave evidence before the Commission, they all denied that their staff were not experienced or well trained. It was also said that operating an airbridge was not rocket science but rather a very simple process. Operator error might also have been due to the unfamiliarity of staff with the operation of new airbridges. Irrespective of the cause, it did not cause serious operational problems and the situation improved very quickly.

[15] <u>No Tap Water in Toilet Rooms and Tenant Areas</u>

[16] <u>No Flushing Water in Toilets</u>

9.85 On AOD and the few days thereafter, the following problems with flushing and tap water were reported:

Date	**Period of Interruption**	**Flushing or Potable Water**	**Areas Affected**	**Tank Room Involved**
Eve-ning of 6 July	About 2 hours	Potable	Certain toilets and tenants in the North Concourse and Northern part of the East Hall in PTB	Tank Room 3
7 and 8 July	3 to 4 other interruptions, each lasting less than 2 hours	Potable	Same as above	Tank Room 3
6 July	Less than 4 hours	Potable	Certain toilets and tenants in the West Hall, North West Concourse and South West Concourse.	Tank Room 8
8 July	About one hour	Potable	Toilet Block 6-17, 6-18 and 6-29	Tank Room 8
7 to 8 July	From 15:00 on 7 July to 07:45 on 8 July	Potable and Flushing	Some toilet blocks and some shops on the south-east side of PTB	Tank Room 2

9.86 AEH Joint Venture ("AEH") is the contractor employed by AA for the installation of the systems which provide flushing and potable water to the toilets in the public areas, and valved connections to the boundary of the tenant areas. AEH subcontracted the supply, installation, testing and commissioning of related electrical and hydraulic works to Rotary (International) Limited ("Rotary").

(a) Problems relating to Tank Rooms 3 and 8

9.87 Immediately prior to AOD, the valves which regulated water flow into the water tanks were not functioning properly. The valves therefore had to be operated manually by Rotary on a 24 hour basis to ensure that an adequate level of water was being maintained in these tanks. On AOD, staff from Rotary were unable to obtain security passes to enter Tank Rooms 3 and 8 which were in a restricted area. As no one was operating the tank rooms, the water in the tanks ran dry. It was alleged that had the Building Management System been operational, the low water level alarm would have warned AMD of the problem and immediate remedial action could have been taken to prevent the tank from running dry.

9.88 Water supply was restored in the morning of 7 July 1998 when Rotary's staff were allowed access to the tank rooms. The tank rooms were under manual operation as late as mid-September 1998 and there has not been any further interruption to the water supply.

9.89 The other interruptions to water supply from Tank Rooms 3 and 8 were caused by repairs on that day or by the fine tuning to the pressure settings necessitated by the significant increase in demand for water after AOD.

(b) Problems relating to Tank Room 2

9.90 The drainage pipes in Tank Room 2 and the Fire Services Tank Room 1 (which is adjacent to Tank Room 2) are connected to the foul water drainage system outside PTB via a manhole. Flooding in tank rooms was not an infrequent event as there had been many occasions of foul water backing up from the external foul water drains into the floor gully in Tank Room 2 and manhole in Fire Services Tank Room 1.

9.91 In the morning of 7 July 1998, flooding in Tank Room 2 was reported. Flooding was caused by a blocked external foul drain which resulted in foul water over-spilling into the tank room. The floodwater had reached some 10 inches high and for safety reason, the electrical control panel that operated the pumps was switched off, causing flushing and potable water supply from Tank Room 2 to stop.

9.92 Rotary and AEH staff attended to the problem and temporary pumps were brought to Tank Room 2 to pump dry the area. Dehumidifying and special drying equipment were also set up to dry out the electrical control panel in the tank room. Water pumping from Tank Room 2 was resumed at about 7:45 am on 8 July 1998.

9.93 As a temporary measure, Rotary was instructed by AA on 11 August to install a temporary pump in Fire Services Tank Room 1 standing by and/or operating 24 hours, seven days a week to ensure that flooding was controlled. The temporary pump diverted the foul water backing up in the manhole to another drainage network in the Baggage Hall on Level 2 which diverted the foul water to the northeast end of PTB.

9.94 The flooding was caused by blockage in the pipe work for which Nishimatsu Construction Co., Ltd. was responsible. On 18 July 1998, through CCTV cameras, it was discovered that a section of the pipeline was broken. Remedial work was carried out and the pipe was reinstated on 15 August 1998.

9.95 The Commission has not received any evidence of recurrence of any of the problems.

[17] <u>Urinal Flushing Problems</u>

9.96 Four problems were identified in relation to urinals in the new airport: (a) difficulties in controlling the flushing water flow; (b) operational problems of the infrared sensors which activate the flushing valves; (c) blockage of urinals caused by rubbish; and (d) cleanliness of the toilets.

9.97 The urinals in PTB were installed by Rotary, a subcontractor of AEH. Lo's is the main contractor for providing cleaning services in the public toilets.

(a) Flow of flushing water

9.98 Difficulties were experienced in controlling the flow of flushing water through the flushing valves. The desired flow rate should be sufficiently high to self clean the valve of seawater sediment whilst at same time not causing splashing. The poor quality of seawater and a low flow rate caused the build up of sediment in the flushing valves of the urinals. The problem with the flow of flushing water and the poor quality of seawater had been identified in early 1998. In addressing the problem of seawater quality, AA issued instructions to AEH to clean the affected water tanks and also to install stainless steel weirs at each outlet in each tank in front of the outlet pipe to the pumps to prevent sand and dirt flowing into the pipe. Whilst the water tanks had been cleaned accordingly, AEH did not install the weirs as instructed.

9.99 Prior to AOD, Rotary suggested to AA to increase the water flow to improve the self-cleaning of valves. Rotary also proposed the installation of hoods to prevent splashing caused by the increase in water flow. However, this was rejected by AA in March 1998, partly for aesthetic reason and partly because AA did not consider this to be a complete solution to the problem.

9.100 In mid-July 1998, AA eventually accepted Rotary's recommendation to install an amended piston within the valves and the installation of hoods. The new piston was installed by AEH at its own expense in August 1998. The installation of the hoods was completed by 11 August 1998.

9.101 According to AA, there are still two outstanding problems with the flushing system. First, corrosion of the solenoids which operate the valves, as they have been exposed to seawater. Remedial work is being carried out by AA. Secondly, there is a residual problem of not having a correct balance of pressure setting for the valves. Rotary, however, denied that such problem exists. It is not clear to what extent the operation of the urinals were affected by these outstanding problems.

9.102 AA also alleged that the problem with the flow of flushing water was attributable to the outstanding need for testing and commissioning of the hydraulic system, which was substantially completed only by the end of October 1998. All rectification work by contractors was completed by 16 October 1998 and generally substantial improvement has been achieved since then.

(b) Problems with sensors

9.103 In the few days immediately after AOD, it was discovered that not all sensors had been correctly set to detect a person standing at normal usage distance from urinal. According to AA, the sensor distance was pre-set by the manufacturer. AA alleged that the problem was caused by the incorrect measurement of sensor distance by AEH, but this AEH denied.

9.104 Another problem was caused by users mistakenly pressing the sensor cover plates, believing this to be a flushing button. This either damaged the sensors or affected its setting. To avoid any misconception, a label reading “Do Not Push” in both English and Chinese was affixed to each sensor cover plate.

9.105 Replacement of damaged sensors was effected by the end of August 1998 and they were fitted with more substantial fixtures to prevent interference and damage.

(c) Blockage of urinals

9.106 Blockages in drains had been caused by users disposing of rubbish into the urinals. The problem was noticeable when the airport first opened, particular on sightseeing days, when large number of people visited the new airport. Rotary alleged that the plastic waste strainers in urinals were not fixed and were sometimes removed, allowing rubbish to get into the system, thereby causing blockages. Regular attendance by cleaners was thus required to prevent blockages.

9.107 The clearing of blockages in urinals was performed by the cleaning contractor, Lo's. This is related to the cleanliness of toilets which is dealt with below.

(d) Cleanliness of toilets

9.108 There were complaints that toilets in PTB were dirty, particularly during the first few days of AOD. Even shortly before AOD, the Financial Secretary had raised the issue of cleanliness in toilets and AA was asked to put an attendant in each toilet to ensure its cleanliness. W44 Mr Chern Heed said in his evidence that AA had been let down by the contractor responsible for janitorial services in toilets (i.e. Lo's). W44 Heed also added that the problem lay with staff training and supervision.

9.109 The toilets were crowded with sightseers and stranded passengers during the first few days of AOD. The heavy usage of the toilets made the cleaning task more difficult. According to Lo's, cleaners were sometimes "crowded out" by the huge number of people queuing up to use the toilets. Other factors affecting the cleaning service included the interruption of the flushing systems, disruption to potable and flushing water supply and the urinal blockages described above. Lo's has also pointed out that there is no ventilation facility in toilets and that has caused smell lingering during heavy usage. This affected the user's impression of the cleanliness of toilets. Lo's alleged that like some other contractors, it also encountered difficulty in obtaining permits to restricted areas which prevented its staff from working in some 33 public toilets within the airside.

9.110 After AOD, Lo's deployed extra staff to clean the toilets. On top of regular cleaning, special task forces were also sent to check and clean the toilets every two hours. These measures alleviated the cleanliness problem and there was improvement to the situation.

[18] Toilets Too Small

9.111 There have been criticisms that the size of the toilets in PTB of the new airport is too small, causing inconvenience to airport users. In particular, the inability of air passengers to get their baggage trolleys into toilets has been highlighted as a problem.

9.112 In his evidence before the Commission, W43 Oakervee attributed the criticism on the size of the toilet cubicles to the fact that the doors of the toilets went from floor to ceiling. He said this may create a claustrophobic feeling on the part of the users. Another reason provided by him was that the Commercial Division of AA had been trying to expand and keep as much space available for commercial areas as possible. This resulted in AA's decision not to go for large and elaborate toilets but, rather, something that was of a finish that met world-class standards and of a size that was functional and met the general specifications. Mr Barry Ball, Senior Architect – Interiors of AA, said in his witness statement that the fact that larger toilet blocks would have reduced the availability of revenue generating space was an important factor which influenced AA's decision not to allow trolleys into the toilets. Other factors included their desire to avoid having a large "dead" area in the middle of the block which would inevitably become clogged by unattended baggage trolleys.

9.113 In fact, the reason for the size of toilets can be found in the design rationale. Under AA contract C101, the detailed design of PTB including the design of the toilets was prepared by Mott. In his witness statement, Mr Winston SHU, the Director in charge of the architectural team at Mott, explained that sizing of toilets in PTB, as in the case of other facilities there, was based on dwell population number and the busy hourly flow rate of passengers at 5,500 passengers per hour. This flow rate was approved by AA as the basic design parameter. AA also approved the adoption of the planning guidelines of the British Airports Authority ("BAA"). These guidelines were formulated on the extensive experience of BAA in operating large international airports.

(a) Distribution

9.114 In accordance with the final design, public toilets in the new airport are provided conveniently along the main passenger traffic flow, having regard to the passenger dwell time in different zones of PTB. Generally, toilet facilities for an airport can either be centralized (ie, with a single large facility at one or two locations) or dispersed (ie, with a number of smaller facilities strategically provided). Given the large physical size of PTB, AA adopted the latter approach which would enable passengers to locate toilets easily and conveniently by shortening the walking distances between these facilities and the passenger processing points such as check-in desks and baggage reclaim areas.

(b) Provision

9.115 Following the BAA guidelines, Mott established a baseline of public toilet provisions in terms of the number of water closets, urinals and hand basins. The actual provisions, which were approved by the Buildings Department of Hong Kong Special Administrative Region Government as adequate for PTB, exceeds the requirements stipulated in the BAA guidelines by 17% for male urinals and 48% for female closets. The urinal stall and hand basin separations, and the water closet cubicle dimensions are based on established architectural standards (eg, AJ Metric Handbook). The size of toilet varies depending on their locations within PTB as well as the number of facilities and the space allowed for circulation in each of them. Large blocks are provided at places such as passenger processing areas and catering outlets where passenger flow and dwell time are expected to be more. In departures and arrivals concourses where the expected dwell time is predictably less, smaller blocks are located at regular intervals. Disabled toilets and nursing mothers rooms are located adjacent to toilet blocks at specific locations. W43 Oakervee testified that the standards adopted by AA conformed to the legal requirements of Hong Kong and were also the norm in public buildings.

(c) Baggage Trolleys

9.116 There are three main areas in PTB where passengers have access to the use of trolleys:-

(i) baggage check-in area at the departures level;

(ii) Baggage Reclaim Hall at the arrivals level; and

(iii) the meeters and greeters area at the arrivals level.

9.117 Mr Shu explained that in deciding whether space should be allowed for trolleys to gain access into toilets in these areas, passenger travelling habits and their convenience were taken into consideration. Most of the passengers who have to bring baggage trolleys into toilets travel alone and hence have no one to entrust their baggage with. As far as toilets at departures level after check-in are concerned, the majority of passengers travelling on their own would check in their baggage in the first instance when they arrive at the airport. The number of passengers who have to carry heavy baggage on trolleys when visiting the toilets at departures level after check-in is therefore considered very small.

9.118 The majority of passengers who use toilets at baggage reclaim would do so while waiting for their baggage to arrive at the reclaim carousel. They do not tend to collect their heavy baggage and place it on trolleys before going to the toilets. If they do, they can leave their baggage unattended in this area because the reclaim hall is usually the safest part of the Terminal from theft. It is a restricted area and all the baggage has to go through Customs Control and is subject to possible scrutiny.

9.119 As for toilets in the arrival meeters and greeters hall, once the passengers clear Customs, passengers travelling on their own who are not meeting someone at the airport usually head for transport. Toilet provisions in this area cater mainly for meeters and greeters who do not have baggage and need not use trolleys.

9.120 After considering the low number of passengers likely to take trolleys into toilets, AA decided that trolleys would not be allowed into these toilets but suitable circulation space around the hand basins and urinal stalls would be made available so that baggage trolley could be left in the central area of the toilet even if it was brought into it. W43 Oakervee confirmed that toilets had been designed deliberately not to allow people to get a trolley in.

9.121 In his witness statement, Mr Shu also pointed out that an open design was adopted for toilet entrances because it would facilitate passengers carrying bags and that there was ample storage and shelving space inside toilets for hand carried baggage. Space was also available at the toilet entrances for use of parking of baggage trolleys. Furthermore, for rare occasions where heavy baggage on trolleys must be taken into toilets, passengers could make use of the toilets for the disabled which were located next to the regular toilet blocks and were spacious enough to accommodate trolleys.

9.122 As a result of the comments received from the first terminal operations trial, AA instructed the contractor to carry out a series of enhancement works to the toilets. These included provision of additional lighting, installation of hand dryers and increasing the depth of toilet cubicles and the width of the dry shelves. In particular, the height of the cubicle doors, which stretched from floor to ceiling according to the original design in order to prevent theft, was reduced. The width of some doors was also altered. In addition, new toilets were put in the meeters and greeters area which are quite large. All these enhancements suggest that AA had taken on board the comments received and exercised a good degree of flexibility in modifying and improving the design.

[19] Insufficient Water, Electricity and Staff at Restaurants

9.123 There were problems with water and electricity supply to restaurants in the first few days after AOD, causing inconvenience to passengers and staff. AA alleged that for some tenants, insufficient staff had led to unsatisfactory service, long queues, lack of food variety and some restaurants had to close early. Customers also complained of inadequate service staff.

(a) Water supply

9.124 Disruption to the potable water supply to the tenant areas during the first few days of airport operation has been dealt with under item [15] above. There were complaints that most of the tenants left to the last minute to apply for the connection of the water supply, resulting in its late availability. AA also alleged that some tenants often carried out their work not to the required standards, causing delay to the connection of water until the work had complied with the requirements. Despite the problem, water supplies were connected in order to make PTB habitable as early as possible. This resulted in some leakage or flooding though the problems were not significant.

9.125 The tenants, however, raised their concern over delays by AA to provide water, gas and power to tenant areas. There were also complaints by tenants that they were not receiving security permits promptly to enable contractors to carry out work in restricted areas.

(b) Electricity supply

9.126 Similar allegations were made by AA and the tenants in respect of electricity supply. AA complained that the tenants took possession of the premises only at the last possible moments, resulting in a flood of last minute requests for service connections which could not all be handled in the time available. AA also alleged that the late submission of applications and supporting materials from the tenants had been a significant contributing factor to the problem. Most of them submitted their design in March and April 1998.

9.127 The restaurant tenants' preference to use electricity instead of gas was out of AA's expectation. More power was also requested by airline tenants at a late stage. This increased the overall demand for electrical power which resulted in the overall power system to be upgraded. This necessitated the redesign, specification and procurement of new equipment which took time to install and commission.

9.128 There were a number of occasions of short electricity outage on and shortly after AOD. These, according to the AA, were primarily caused by fitting out contractors of the tenants who switched off power without the AA's permission so that they could complete outstanding work.

9.129 AA further alleged that some outages on or after AOD were caused by tripping of circuit breakers caused by faults in electrical installation put in by tenants. Only limited areas were affected and there was no major disruption to terminal operations.

9.130 As at 10 August 1998, two relatively serious outages affecting tenants were reported. The incident on 7 July 98 was caused by improper overload settings between a tenant's installation and AA's installation. This caused a power failure to landside retail shops at Level 7 for 2 hours and 40 minutes. The long period of outage was resulted because the maintenance staff of both the contractor and AA were refused access to the switch room by a security guard.

9.131 Three circuit breakers burnt out in a power outage to Levels 5 and 6 south offices on 17 July which lasted about 4 hours. AA suspected the cause to be related to a contractor staff of Cathay Pacific working on the CX lounge who left a fire hose reel running. Water ran through the joint of the floor, ran along the cables and finally fell onto the live terminal causing a short circuit across the terminals. Staff from the contractor and AA's maintenance attended to the problem and repair work was carried out that night.

(c) Staffing problems

9.132 There were complaints that service at restaurants was unsatisfactory with long queues, a lack of food variety and an inability to keep the shop open for long hours. These problems were in turn partly caused by the water and electricity supply problems. In some cases, the problems were due to insufficient or inexperienced staff at the restaurants.

9.133 Restaurants on airside experienced problems with their staff not receiving security passes by AOD thereby preventing them from attending to duties. On the landside, excessive demand for catering facilities were generated by the influx of an unexpectedly large amount of curiosity visitors in excess of 60,000 per day in the first week of AOD.

9.134 Restaurant operators were experiencing low efficiency problem and significant staff turnover. A number of caterers were believed by AA to have employed staff with little or no previous relevant experience.

9.135 To address the issue, AA reminded all catering licensees to comply with the service standards incorporated in the licence agreements. Action has taken on 7 July 1998 to ensure 24-hour operation of restaurants, where necessary, and reliability of stock. Improvement was made to the process of issuing permits.

9.136 The staffing problem was short-lived since the number of sightseers significantly decreased after the first week of AOD as curiosity over the new airport waned with time. Generally, the water, electricity and staffing problems only caused inconvenience to users for a week or so and occasionally thereafter.

[20] Rats Found in the New Airport

9.137 Towards the end of August 1998, during the course of the Commission's inquiry, it was reported by the media that thousands of rats were pestering the new airport. It was alleged that parts of PTB and the aircraft maintenance facilities were affected. Some newspapers accentuated the seriousness of the problem by digging out the vernacular name of CLK, being "Rat Island".

9.138 In response to the Commission's inquiry letter, AA said that rats were a problem throughout Hong Kong, especially at construction sites. It had planned a strategic pest management programme, including rodent control. In October 1997, AA arranged for the employment of a full time professional pest control contractor to provide pest control for, inter alia, the common areas of PTB and the ground transportation system. This involved the implementation of an intensive rodent eradication programme and the provision of regular maintenance services for rodent control. An intensive 120-day rodent eradication programme was implemented with effect from 1 May 1998. AA had also employed an in-house pest control team to carry out rodent control work for the areas occupied by AA and the common areas at CLK. The work area covered the airfields, aprons, runways and small airport ancillary buildings when the airport commenced operation in July 1998.

9.139 Airport tenants such as Hong Kong Aircraft Engineering Company Limited ("HAECO"), Hong Kong Air Cargo Terminals Limited, and CPCS and PTB tenants such as restaurants, retail stores, government and airline offices were required to implement their own pest control programmes as part of their tenancy agreements with AA. A continuous monitoring programme was maintained by the Environmental Group within AA's AMD. Periodic environmental audits, including vermin control audits, are performed in tenants areas to ensure that adequate pest control programmes have been implemented.

[21] Emergency Services Failing to Attend to a Worker Nearly Falling into a Manhole While Working in PTB on 12 August 1998

9.140 On 12 August 1998, a worker nearly fell into a manhole in a cable tunnel L3 near Gate 61 in PTB. He sustained minor injuries. It took 17 minutes for ambulance service to reach the cable tunnel and locate the injured. It was discovered after the arrival of the ambulance that special service operational crew was required to save the injured worker who lay below ramp level. Another call was then made to Fire Services Communication Centre of the Fire Services Department ("FSD") through AOCC 21 minutes after the first report of the incident. AA confirmed that it was not normal AOCC procedure to request both ambulance and fire service assistance when a medical emergency was reported.

[22] Traffic Accident on 28 August 1998 Involving a Fire Engine, Resulting in Five Firemen being Injured

9.141 On 28 August 1998, a Fire Services Vehicle was travelling along the slip road of the Airport Road towards Tung Chung. Upon approaching the merging point with East Coast Road, the driver alleged that he had to turn right to avoid collision with another vehicle. However, he lost control and hit the kerb embankment. Upon impact, the vehicle ran across the road surface and down a slope and eventually came to a stop at another slip road. Five FSD personnel were injured.

[23] <u>A Maintenance Worker of HAECO Slipped on the Stairs inside the Cabin of a Cathay Pacific Aircraft on 3 September 1998</u>

9.142 On 3 September 1998, a maintenance worker of HAECO fell from a flight of staircase inside the cabin of a Cathay Pacific aircraft while at work. He accidentally slipped on the stairs and sustained minor injuries.

[24] <u>A Power Cut Occurring on 8 September 1998, Trapping Passengers in Lifts and on the APM as well as Delaying Two Flights</u>

9.143 The press reported that on 8 September 1998, passengers and airport staff were trapped in lifts and APM for several minutes in parts of PTB, delaying two flights. The incident is being investigated by Rotary and no firm conclusion of the exact cause of power failure can be drawn by the Commission.

[25] <u>Missed Approach by China Eastern Airlines Flight MU503 on 1 October 1998</u>

9.144 On 1 October 1998, a China Eastern Airlines flight MU503 was instructed to carry out “missed approach” when it was obvious to the Air Traffic Control that a Cathay Pacific aircraft was unable to vacate the runway in time. MU503 was about 12 km from the airport when the Cathay Pacific Airbus on the runway was permitted to depart. The pilot of the airbus reported that the aircraft could not take off because of a passenger problem in the cabin. The ATC tower controller judged that the runway could not be vacated in time for the landing of MU503 and the pilot of the latter was instructed to carry out “missed approach”. Missed approach procedures are safe and standard manoeuvres published in the Aeronautical Information Publication for the pilots to follow.

CHAPTER 10

MAJOR PROBLEM -- THE OPERATION OF FIDS

Section 1 : Importance of FIDS in AOR

10.1 FIDS is the acronym for flight information display system. FIDS receives flight information from various systems interfaced with it and processes the same for dissemination through data-feed or display for various users of the new airport. There are at least the following users of the flight information provided by or through FIDS:

(a) Airport Authority ("AA");
(b) Air Traffic Control ("ATC") of Civil Aviation Department ("CAD");
(c) passengers;
(d) Baggage handling operator ("BHO"), ie, Swire Engineering Services Ltd ("SESL");
(e) Ramp handling operators ("RHOs"), ie, Jardine Air Terminal Services Ltd ("JATS"), Hong Kong Airport Services Ltd and Ogden Aviation (Hong Kong) Limited;
(f) Cargo terminal operators ("CTOs"), ie, Hong Kong Air Cargo Terminals Limited and Asia Airfreight Terminal Limited; and
(g) airlines and other members of the airport community.

10.2 Flight information consists of a large number of items of information that are required for operation of an airport, such as the time of arrival and departure of flights, the check-in counter or desk number, the departure gate number, the flight status such as "gate open", "boarding", "gate closed" or "airborne", "arriving" and "arrived", the arrival gate number, the baggage reclaim belt number, exit gate number, etc. It is apparent that all these items are necessary for passengers and the airlines of which they are customers. In addition, other items such as baggage lateral (spur) allocation, aircraft stand or bay allocation, aircraft type and registration number are important for the purposes of airlines, BHO, RHOs, CTOs and other service providers operating in an airport.

10.3 One of the most important elements of flight information is time, ie, the time of arrival and departure of flights coming in and going out of the new airport. There are three kinds of time: scheduled, estimated and actual, meaning the time scheduled by airlines, the time estimated by airlines and ATC by the use of the radar tracking processor, and the actual time witnessed by ATC or AA or airlines. These times are respectively called scheduled time of arrival ("STA"), estimated time of arrival ("ETA") and actual time of arrival ("ATA") for arrival, and scheduled time of departure ("STD"), estimated time of departure ("ETD") and actual time of departure ("ATD") for departure, and they are relied on by passengers, airlines, BHO, RHOs, CTOs and other users of the new airport. The time information is particularly important to the airlines, RHO and CTOs and other service providers for their provision of services in their respective fields and on which their planning and efficiency are depended. A pictorial diagram prepared by W55 Dr Ulrich Kipper, an expert appointed by the Commission, showing these kinds of time can be found at **Appendix IX**.

10.4 Apart from time, the number of the gate allocated to a particular flight of an airline is also important as this information is essential for the airline as well as for the passengers. The check-in desks assigned to the airline will enable the airline to know where to send their staff to serve the passengers who likewise need to know where to check in.

10.5 Baggage lateral allocation by BHO is necessary for RHOs to know from which lateral to pick up departing baggage after the bags have gone through the check-in counter, the conveyor belts and the security check, so that the RHO serving the airline can deliver it to the relevant departing aircraft. RHO will also need to know the stand allocation of the aircraft to which baggage will be delivered. For arriving aircraft, the RHO and other service providers need to know the stand allocation, so that they can deploy their vehicles and manpower to await the arrival of the aircraft, promptly providing services such as catering, water, fueling, cleaning and unloading the baggage and cargo from it. RHOs will also need to know the stand allocation in order to serve the passengers. For aircraft to be parked at frontal stands bordering Passenger Terminal Building ("PTB"), they need to send operators to operate airbridges promptly to disembark passengers. For aircraft to be parked at remote stands in the airfield, RHOs should know the stand number well before arrival of the aircraft for mobile passenger steps and tarmac buses to be despatched to meet the passengers on arrival. While the baggage will be delivered to the lateral leading up to the reclaim belt allocated for the flight for retrieval by passengers, the cargo will be delivered to one of the two CTOs as consigned. The registration and type of the aircraft are sometimes also necessary to confirm identification of the aircraft and for deployment of resources. A diagram showing the items of information required by main airport users is at **Appendix X**.

10.6 ATC would also need to know the flight information and stand allocations so to effect air traffic control. Time is absolutely necessary for planning of air traffic, and stand allocation is essential for giving directions to aeroplane pilots on the runway and apron.

10.7 SESL, as BHO, is a provider of information for FIDS as well as user in baggage handling. SESL assigns reclaim laterals for arriving bags through the FIDS workstation in the Baggage Control Room ("BCR"). The allocations are displayed to RHOs on LCD boards in the Baggage Hall on Level 2 and to passengers on monitors and LCD boards in the Baggage Reclaim Hall ("BRH") on Level 5. Reclaim laterals are usually assigned based on a daily template prepared by SESL and provided to RHOs the night before. However, SESL may make changes to the pre-arranged allocation based on changes in flight times and stand allocations provided by FIDS. The new lateral will then be displayed on

FIDS for the information of RHOs and passengers. For departure baggage to be sorted by the Baggage Handling System to departure laterals, SESL is required to enter the daily flight schedule into the Sort Allocation Computer which may be updated in accordance with information received from AOCC, normally via FIDS.

10.8 Other members of the airport community include hotels, freight forwarders, handling agents and providers of transportation for passengers, baggage and cargo, etc and they all need flight information. AA had FIDS installed in the new airport and provided all such information through monitors and liquid crystal display ("LCD") boards situated at various strategic locations throughout PTB. On the other hand, airline offices, RHOs and CTOs and other members of the airport community obtain flight information essential to their operations from a flight information distribution system known as Flight Data Display System ("FDDS"). FDDS is a service provided to the airport community by Hong Kong Telecom CSL Limited ("HKT") which entered into a contract with AA to obtain the information through a database installed by AA called Airport Operational Database ("AODB")with which FIDS is interfaced. There were hundreds of users of FDDS in the airport community, and representatives of a few sectors are set out in **Appendix XI**, which also contains a summary of their evidence. Although RHOs are not included in the appendix, they have always been FDDS customers. HKT also provides a service connected with FDDS, which is to provide data feed to computer systems of customers. This service is known as Flight Display Data Feed Services ("FDDFS").

10.9 Timely, accurate and complete flight information and status is therefore considered by all concerned as critical for the operation of the new airport. In all the correspondence between the Commission and all interested parties and throughout the oral testimony provided to the Commission, there has been no gainsay of the importance of FIDS. Everyone recognises FIDS as critical to the operation of the new airport. AA entered into a contract, C381, with G.E.C. (Hong Kong) Ltd ("GEC") for the latter to provide FIDS to the new airport as early as 16 June 1995, and never retracted from its position that FIDS, with the necessary functionality of providing the flight information and status, should be ready for operation on airport opening day ("AOD"). The Airport

Development Steering Committee ("ADSCOM") and New Airport Projects Co-ordination Office ("NAPCO") consistently raised concern whenever the progress in the installation, commissioning or testing of FIDS or the training of operators slipped. The importance placed on FIDS by AA, ADSCOM and NAPCO is evident from the minutes of the numerous meetings of these organisations and the voluminous reports, monthly, weekly and even daily, relating to FIDS. Airlines and all service providers participated in training on FIDS and joined various airport and airline trials before AOD for purposes including familiarisation with the use of FIDS. FIDS is indisputably critical to airport operational readiness.

Section 2 : FIDS Operation on AOD

10.10 Many problems were encountered on AOD with FIDS. From the allegations made by various parties, these problems arose in many areas of the operation at the new airport. It is obvious, and no party has ever challenged, that the flight information necessary for passengers and other airport users was not available, inaccurate or incomplete. Although the impact was felt all over the new airport, the events happening at the following places are most telling:

(a) PTB areas where passengers expected to find flight information, and on the ramp where RHOs were working.

(b) Apron Control Centre ("ACC") and AOCC, both of which were operated by staff of AA, and ATC, operated by CAD.

(c) BCR operated by the BHO, SESL.

10.11 On AOD and a couple of days thereafter, both arriving and departing passengers found that there was no, incorrect or inconsistent flight information displayed on the monitors and LCD boards that were supposed to show it. In his witness statement, Mr Raymond HO Wai Fu, the Chief Assistant Secretary for Works (Information Technology) of the Works Bureau, described the situation. He arrived at the new airport at 1:30 pm on AOD. He observed that the large LCD boards just before check-in counters in the Departures Hall and at the Arrivals Hall were not showing updated information. He also found that other FIDS display devices, including the Band-3 monitors at the Immigration counters and the LCD boards at the baggage reclaim belts were not showing correct information. Most people waited for a long time to collect their baggage. Whiteboards were used to show passengers which baggage reclaim belt should be used. He also noted that no baggage trolleys were there and the courtesy telephones at the BRH were not working. When he returned to PTB on Day Two, there were still a lot of people waiting for baggage at BRH. The LCD boards and monitors were still showing outdated or missing information. Whiteboards were still used to display reclaim belt information, departure gates, etc to passengers. He was told by a member of SESL staff that baggage reclaim status was not being updated because ATAs for most flights were not available on FIDS on AOD. In the afternoon of Day Three, Mr Ho observed that the LCD boards at BRH were showing incorrect and outdated information. There were occasions when a display suddenly disappeared and went up again, with some monitors blacked out. Mr Ho also noticed that changes of gates assigned to a departure flight were displayed in the "remark" column. However, fewer people were waiting at BRH for their baggage. On Day Four, during Mr Ho's visit to PTB, he found that the display monitors at the Arrivals Hall and Departures Hall were showing some useful information, such as updates on flights arriving about 15 minutes earlier. However, some monitors were still displaying outdated information. Except for the passengers from one incoming flight who were waiting for over an hour at BRH because the baggage was not transferred from the Baggage Hall at Level 2 to the reclaim belt, Mr Ho observed that baggage handling seemed to be working effectively.

10.12 Monitors and LCD boards were initially the only devices supposed to display flight information for the use of passengers, but what passengers were provided with on AOD were whiteboards showing flight information. According to EEV Limited ("EEV"), there were altogether 1,952 monitors and 150 LCD boards. The monitors were screens of three different sizes, 32", 28" and 15" and located at various places throughout PTB. There were seven types of LCD boards supplied by EEV which were of sizes much larger than the monitors, namely,

Quantity	Type	Nature and Location of Board
8	4302	Check in Summary Boards
82	4308	Gate Display Boards
6	4314	Meeters and Greeters Boards
48	4321	Baggage Reclaim Boards
2	4319	Baggage Reclaim Summary Boards
4	4340	External Baggage Reclaim Summary Boards
16	4350	Automated People Mover (“APM”) Signs
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4302	Located in four strategic areas above the check in aisles.
4308	Located at departure gates, normally two per gate.
4314	At meeters and greeters area, located above the passenger exit doors on Level 5.
4321	Located on each baggage reclaim belt: four boards per belt.
4319	Located at place prior to airport immigration for arriving passengers, advising them which hall to enter in order to reclaim their baggage.
4340	Located at each ramp entrance to the Level 2 Baggage Hall, advising BHO where to load arriving bags.
4350	A dynamic sign located above each door for APM and not part of the flight information system.

10.13 The so-called flight information displayed on the monitors and LCD boards caused great anxiety and confusion to the passengers on AOD. Whiteboards that were used instead were limited in number. For instance, sometime after 7 am on AOD, three whiteboards were set up at Level 5 Baggage Reclaim Hall, two at Level 6 Departures Airside, and another two at the Meeters and Greeters Hall. Temporary signage for check-in counter allocations were posted at the Departures Hall at Level 7, and all gate assignments including gate changes were announced through the Public Address System ("PA"). However, these limited number of whiteboards and devices were no comparable substitute for the monitors and LCD boards had they worked. W37 Mr Dominic Alexander Chartres Purvis, the Manager of Customer Services of Cathay Pacific Airways Limited ("Cathay Pacific"), had this to say:

(a) The two whiteboards at the Level 6 Departures Airside might need to display 100 flights leaving over a two-hour period (35 scheduled movements per hour plus about 30 flights delayed);

(b) Flight information on the whiteboards in (a) was written up in red ink and was messy and difficult to read. It was in practice impossible for AA staff to keep these whiteboards up to date in such a way that they provided timely information on departures when passengers were crowding around them and asking questions; and

(c) The whiteboards in BRH were also messy and difficult to read. AA staff had similar problems updating these boards.

10.14 The customers of the FDDS service provided by HKT did not receive correct or complete flight information either. Their complaints can be found in **Appendix XI**. Inside the new airport, the three RHOs did not receive accurate, complete and reliable flight information from either FIDS or FDDS. For the purposes of RHOs, the most important items of information were the ETA and stand allocations of aircraft, which were necessary for them to send vehicles and staff to parking stands to service aircraft, such as loading and unloading baggage and cargo, prior to departure or arrival. For aircraft parked at remote stands, passenger steps and buses would have to be provided for disembarkation of passengers and bringing them to PTB. Lack of such information compelled RHOs to use the telephone to seek it from ACC or AOCC, but the telephone lines were too busily engaged. RHOs sent staff to attend ACC or AOCC to get the information, or even deployed persons to go around the apron to chase landing aeroplanes to see where they parked. When the stand location was identified, there was difficulty in relaying the information to the RHO offices because the Trunk Mobile Radio ("TMR") System that they used was congested beyond capacity by the unexpectedly large number of calls. These actions taken to alleviate the situation drained RHOs of their resources and aggravated the delay in making baggage available at the reclaim belts for arriving passengers and in loading baggage onto departing aircraft.

10.15 At about 10 am, RHOs had a meeting with AA personnel at AOCC, and it was decided that whiteboards should be set up at Airport Emergency Centre ("AEC"), to which RHOs could send their staff to check ETA and stand allocations. However, according to W5 Mr Allan KWONG Kwok Hung, Assistant General Manager, Operations of JATS, whiteboards were not set up until about 4 pm, as AA needed time to source more whiteboards and finalise logistics and procedure. According to W26 Mrs Vivian CHEUNG Kar Fay, Terminal Systems Manager of AA, whiteboards were only set up at the AEC, which is situated next to AOCC, as late as 7 pm on AOD. Most AA witnesses agreed with this evidence.

10.16 CAD's operations at ATC on AOD also experienced difficulty. AA obtained flight STA and STD from the seasonal schedules provided by airlines and obtained ETA and ATA from CAD which was responsible for air traffic control, giving guidance to aircraft for their landing and departure. ETD and ATD would be available to AA either from airlines or from CAD. The flight information and flight status so obtained by AA would be stored in AODB, which was linked to and interfaced with FIDS. As can be seen from the diagram at **Appendix X**, the interface between AODB and FIDS would enable the free flow of information between the two systems. FIDS would draw the information from AODB, process, disseminate and display the same through itself or other systems for users, for instance, AA's ACC and AOCC, the airport community and passengers.

10.17 Stand allocation was to be done by ACC of AA. Within FIDS, there was a Terminal Management System ("TMS") which would deal with allocations of stands, gates and check-in and transfer desks. For the purposes of administering air traffic control, CAD would need to have information as to the parking stand to be allocated by AA to arriving aircraft and the parking stand of departing aircraft.

10.18 It is not disputed by any of the parties that one of the ways of AA to obtain ETA and ATA was through CAD. CAD's information on ETA and ATA is derived initially from the flight plans provided by airlines and subsequently when an aircraft comes close enough to Hong Kong and can be detected by CAD's radar tracker, the information would be provided by the radar tracker. There was also another way whereby ETA and ATA could be provided by CAD to AA, namely through the Aeronautical Information Database ("AIDB") of CAD. It was agreed between AA and CAD in meetings held several months before AOD that

(a) there was to be a link between AA's AODB and CAD's AIDB and radar tracker;

(b) CAD's AIDB and radar tracker were to send ETAs to AA's AODB;

(c) AA's AODB was to pass information on stand allocation to CAD's AIDB;

(d) as the ETA and ATA from CAD's AIDB and radar tracker would not be 100% accurate, AA should manually authorise those data before they were fed into AODB as updates for distribution to the other AA systems such as FIDS;

(e) if the AODB/AIDB and radar links should for any reason fail or become unreliable, then contingency measures should be taken, so that ETA and ATA would be supplied by CAD to AA by telephone or fax, and stand allocation would be supplied by AA to CAD also by telephone or fax; and

(f) CAD would also provide landing sequence displays which also contained ETA and ATA to AA.

10.19 It should be noted that the ETA and ATA supplied by CAD through AIDB and radar tracker would, pursuant to the agreement, go through authorisation before being fed into AODB and such information would then be available to FIDS for dissemination mainly through display devices to users.

10.20 On AOD, the AODB/AIDB link was not used for fear that there would be too much drain on manpower to screen the information on over-flying flights to be transmitted. Only the radar link was connected. Until 8:30 am, the ETAs provided by CAD's radar tracker had in fact not gone through the manual authorisation process agreed between CAD and AA. The reason, as described by W24 Ms Rita LEE Fung King, the FIDS Project Manager of AA's Information Technology ("IT") Department, was that the AODB and AIDB and radar tracker interface had been tested with flight information for a couple of weeks before AOD, and it was found that the information was reliable. She and her colleagues in the IT Department and Operations Department therefore decided that it was not necessary to screen the flight information from CAD before feeding it into AODB. This decision was, however, not communicated to CAD prior to AOD. On that day, before 8:30 am, the flight information provided through CAD's radar tracker was missing or inaccurate. One situation was that a few ETAs of aircraft were much earlier than their STAs. This caused TMS Gantt chart boxes to overlap and be in conflict, with resultant "green bars". This confounded ACC operators and affected their operations on TMS. A stand just outside PTB, known as a frontal stand, and as distinguished from a remote stand, is linked to a gate leading into the terminal, and a problem with the allocation of frontal stands also affects the gate allocation. As a result, at 8:30 am, the link between AODB and the radar tracker was disconnected. Moreover, the landing sequence display that would also provide ETAs and ATAs did not work inside AA's ACC or AOCC, although the same landing sequence display was available at ATC Tower without any report of failure. The computers and cables for receiving the landing sequence display at ACC and AOCC were supplied by AA, whereas the hardware and dedicated data lines for ATC Tower were provided by CAD. The contingency plan of providing the ETAs and ATAs was thereafter put in place, CAD supplying ETAs and ATAs to ACC at first on the telephone and later that day by fax. The stand allocation information was similarly provided by ACC to CAD also through telephone and then fax.

10.21 People who were in ACC told the Commission the events that occurred there. When W28 Mr Anders YUEN Hon Sing, an Assistant Airfield Duty Manager stationed at ACC, came on duty on 5 July, TMS was stable. The seasonal schedule was already loaded in both TMS and Stand Allocation System ("SAS"). The daily flight schedule for 6 July was loaded into SAS, and the schedule for 6 July was also automatically rolled out on TMS. ACC staff used SAS for optimisation in the allocation of parking stands, following a decision made about three weeks before AOD to use SAS as the primary stand allocation tool when TMS was at that time found not to be too stable. At about 4:30 pm on 5 July 1998, an ACC operator performed optimisation of all flights from the scratch area to the allocation area in TMS without problem. This was for the purpose of preparing TMS for input and confirmation of stands allocated by the SAS optimisation function. It was intended that after the stands were set out on the Gantt chart on the TMS screen through the use of its own optimisation process, the operators would then adjust the allocations on TMS to make them consistent with SAS, and then confirm them on TMS. The aim was to use TMS, an integral component of FIDS, to disseminate and display the stand allocations (and other flight information) through FIDS, because SAS is a stand-alone system which does not link with FIDS and cannot be used for dissemination of flight information. At around 9 pm, both TMS and SAS were stable.

10.22 At about 9:15 pm, the first of the relocation flights from Kai Tak arrived. There were 29 such flights which were flying in from Kai Tak to the new airport as Kai Tak was to close for operation the next day. The last relocation flight arrived at 1:29 am. For all these flights, ACC staff entered chocks-on time and the registration number in the FIDS Man Machine Interface ("MMI") which is a workstation for manually operating FIDS. FIDS then displayed a prompt linking the registration number to the relevant departure flight. The ACC operator invoked the function, thinking that this would avoid the need to manually enter the registration number for the subsequent departure, but not realising that this would later inhibit flight linking operations by manual linking procedures in TMS.

10.23 The daily flight movement sheets received at about 1 am in the morning of 6 July 1998 from Cathay Pacific and Hong Kong Dragon Airlines Limited contained a number of changes from the airlines' schedules. Mr C K CHAN, Senior Airfield Supervisor of AA, attempted to perform the necessary flight swaps in TMS. A flight swap is necessary where there is a change of aircraft for an arrival or departure flight from that originally planned. The same aircraft that arrives bearing an arrival flight number will normally be used for a departure flight with a different flight number, although the aircraft is the same. When an aircraft other than the arriving aircraft is used for the departure flight as originally planned or when a different aircraft is used for a flight other than that previously designated, a flight swap is required. At about 2:10 am, Mr C K Chan reported to W29 Mr CHAN Kin Sing, another Assistant Airfield Duty Manager at ACC, that he was unable to link the relocated Cathay Pacific aircraft, that TMS was operating slowly, and that it was taking a number of minutes for the system to respond to the link select command. W29 Chan told Mr C K Chan to prepare the stand allocations by using SAS.

10.24 W28 Yuen then attempted to do the swapping in TMS himself manually but was unable to complete any of the swaps. Shortly afterwards, Mr C K Chan told W28 Yuen that SAS had crashed in the course of flight swapping. W28 Yuen explained to the Commission how SAS crashed. When an attempt was made to do a flight swap, the Gantt chart on the monitor remained unaltered with the input. When further attempts were made, the SAS screen turned blank and the Gantt chart disappeared.

10.25 At about 2:30 am, W28 Yuen telephoned City University ("City U"), the contractor employed by AA to supply SAS, and reported the flight swapping problem of SAS. City U agreed to attempt the swaps themselves from their offices in Kowloon. In accordance with City U's suggestion, W28 Yuen asked Mr C K Chan to send City U the flight swapping details by fax.

10.26 At about 3 am, in view of the problems with the two systems, ACC staff started to prepare a manual Gantt chart and manual allocation board in the event that these problems could not be resolved. Whilst others began this process, W28 Yuen again tried, without success, to overcome the flight swapping problem in TMS. By about 4 am, the manual stand allocation procedures had been put in place and allocations made for flight movements up till about 10 am.

10.27 At about 5:30 am, W28 Yuen noticed that one or two flights were displaying green bars next to their entry on the Gantt chart in TMS. The number of green bars steadily increased, covering, in some cases, the adjacent entry on the Gantt chart, and eventually they appeared in relation to about 30 out of 64 of the boxes for flights on the Gantt chart. The "green bar problem" rendered the affected flight numbers on the chart illegible to operators, giving them the impression that there was something wrong with TMS. The green bars, according to W28 Yuen, were caused by ETA being earlier than STA by more than 15 minutes.

10.28 W28 Yuen also assisted other ACC operators with the entry of chocks-on and chocks-off time (plus registration number where applicable) on a FIDS MMI workstation. The system response time was very slow, sometimes taking 10 minutes or more to respond. In addition, in the course of trying to scroll the display, the FIDS MMI frequently produced a number of query boxes, asking the operator to click to confirm the command. The processing to clear each box often took several minutes and accordingly delayed the entry of data. During the day, W28 Yuen also assisted, on a number of occasions, in the re-booting of a FIDS MMI workstation, which was necessary when the FIDS MMI hanged.

10.29 W29 Chan told the Commission that he called the IT Department of AA when the flight swapping was first encountered at around 2 am. He spoke to a female person who said that she would go to check the server, but nothing was heard from her afterwards. On the other hand, W28 Yuen testified that he knew that W29 Chan had contacted the IT Department, but when there was no response, W28 Yuen called W24 Lee at about 3 am and asked for help. He could not recall the details of the conversation. After that telephone conversation, he was not able to contact W24 Lee again over the telephone, and she only arrived at ACC at about 6:30 am. She then dealt with the flight swapping and was able to do some of them, but she also experienced slow response from TMS. W34 Mr Peter Lindsay Derrick of The Preston Group Pty Ltd ("Preston") arrived at ACC at about 12:30 pm and assisted in the flight swapping. However, the slow response remained throughout the rest of the day.

10.30 During the course of the day, starting from early morning, everyone inside ACC was kept very busy, not only by trying to enter data on TMS FIDS MMI workstations, but also by having to answer numerous telephone calls from airlines and airport operators requesting stand allocation information. The information was supplied by referring to the manual Gantt chart and the manual allocation board. Information had to be relayed in this manner because flight information, in particular stand allocations, was not being disseminated and displayed on FIDS accurately and completely. This caused delay in the departure of flights and affected stand allocation to arriving flights, with snowball effect. Full apron was experienced, according to W28 Yuen and W29 Chan, between 12 midday and 5 pm and between 8 and 11 pm. During those periods, arriving aircraft had either to land later or to wait on the apron for a next available stand to be assigned to it.

10.31 During the night of AOD, W28 Yuen continued to assist with the input of data (chocks-on, chocks-off time and registration numbers). Much of the data was now outdated but needed to be entered into the FIDS MMI to bring the system up to date. The system response time was still slow and by the early morning of 7 July the ACC staff had still not caught up with real-time operation. They continued with manual stand allocation. It was at about 2 pm on 7 July that W24 Lee demonstrated to W28 Yuen that it was necessary to clear the registration number and chocks-on time in order to perform flight swapping.

10.32 The backlog of information having been cleared, ACC staff were able to use TMS for optimisation of stands on 8 July, with the continued assistance of AA's IT Department.

10.33 The situation in AOCC was no better. The events on AOD were recorded in a contemporaneous FIDS log kept in AOCC, which was produced as attachment 16 to the statement of W26 Cheung, AA's Terminal Systems Manager stationed at AOCC on AOD. The following major events were recorded in that log:

(a) 06:00 hrs AIDB/AODB interface was down. The landing sequence monitor was unstable. FIDS/AOCC was unable to receive ETA, ATA, ATD and other flight movement updates. W26 Cheung clarified in her testimony that the down time of AIDB/AODB should be at about 8:30 am.

(b) 06:30 hrs The confirmed gate/stand allocation entered by ACC/AOCC operators into FIDS/TMS was automatically moved/removed by the system to a wrong gate/stand. Some confirmed gate allocation information in TMS was not passing through to the FIDS/MMI and displays. Some confirmed desk allocations in FIDS/TMS were lost in the system. FIDS/TMS Gantt chart started to automatically shut down frequently. Restart of the Gantt chart was required but took about 30 minutes. This caused great delay in updating the system with information.

(c) 07:00 hrs Duty staff reported that inconsistent flight information was being displayed on the monitors at different locations. Some of FIDS displays were not reflecting what had been updated in the system by the operator. About 80% of displays of boarding gates were either unable to display correct flight information or to display anything.

(d) 08:00 hrs FIDS workstations performed very slowly, not able to handle all the input by ACC, AOCC and BCR. This especially caused great problems in updating TMS with stand/gate allocations and confirming the allocations.

(e) 10:00 hrs FIDS workstations at BCR hanged and BHO was not able to input reclaim belt assignment. FIDS had not been able to show any information at the Baggage Hall on Level 2 allocation of reclaim belts.

(f) 10:30 hrs AOCC was notified that monitors and LCD boards were not showing the updates entered into the FIDS workstations. Electronic Data Systems Limited ("EDS") checked the host server which was down and needed to reboot the system. Displays were refreshed at around 11 am.

(g) 11:00 hrs AOCC FIDS workstations performed even slower. It took 20 to 25 minutes to allocate a reclaim belt.

(h) 12:00 to 15:10 hrs Failure to update information at various gates and failure to login at check-in counters and gates were experienced.

(i) 20:00 hrs FIDS workstations continued to perform slowly. It took 20 to 25 minutes to allocate reclaim belt. W26 Cheung told the Commission that the reclaim belt function was especially slow, while the other functions were also slow, but not to that extent.

10.34 Turning to the events in the BCR, Mr Guy Gerard Summergood of EDS stated that on AOD, at approximately 8:15 am, an operator in BCR was progressing the baggage status, cross referencing with a paper for allocation of flights to reclaims, and marking off flights as they were allocated and cleared from the MMI. There had not been many pre-allocations made prior to Mr Summergood's arrival in the BCR, meaning that additional work had to be done by the already busy operator. The operator often changed the status of flights from FIRST BAGS (the time when the first bag is put onto the baggage reclaim carousel) through to DONE (the time when all the bags have been reclaimed) without a pause for LAST BAGS (the time when the last bag is put on the baggage reclaim carousel), with an interval of approximately 30 minutes in between. If an ATA was supplied but LAST BAGS was set too early, the Timed Updates ("TU") would cause the flight to be cleared from the display. Mr Summergood noticed that TU was set too short and advised AA that TU be increased to avoid flights being cleared from display too early. During the course of the day, Mr Summergood also noticed that the status progression to INTERNAL (the time when the baggage is inside PTB external baggage hall) was sometimes delayed and, on one occasion, the status was progressed to DONE too quickly. The net result of these failures was that on AOD passengers had to wait for a substantial period before any information regarding the location of their baggage was displayed.

10.35 Mr Summergood thought that the problems were due to lack of familiarity with applying the process in a new working environment and the pressures involved with backlogged flights. While this view will be examined in Chapter 13, it should be noted that he also stated that on AOD, baggage reclaim displays were sometimes blank or displaying outdated information. He further said that the speed of the system was initially slow and degraded to taking 8-12 minutes to perform any operation on the MMI, although data was still being processed in the meantime and the system was not idle. He contacted EDS staff in the FIDS room at the AOCC and they were aware of the speed problems. Following reboot of the system at approximately 10:45 am, the performance improved significantly. However, the AA staff who gave evidence before the Commission did not agree that there was any significant improvement in performance after 10:45 am.

10.36 Mr Rupert John Edward Wainwright of EDS was also in the new airport on AOD. He provided a witness statement to the Commission. His role was to deal with database related problems during installation of builds and to diagnose and solve performance problems. One of the issues that he monitored was database locking.

10.37 Mr Wainwright arrived at the new airport at 10:30 pm on 5 July. According to him, from his arrival until 6 am on 6 July the database and FIDS system showed no signs of performance problems. From then onwards, however, he noticed the Central Processing Unit ("CPU") usage increasing although the system was still functioning. From about 8:00 am onwards the Oracle database processes were not able to get all the CPU usage that they required owing to conflicting demands from other FIDS and TMS processes, which would have caused variable response times in the system. Soon after 8 am he began to get reports from the AOCC staff of MMI users encountering the Oracle error associated with Oracle shared memory allocation being too small, called ORA-04031. These errors were infrequent, but from 8 am onwards the disruption caused by the ORA-04031 problem increased slowly to peak just before 10 am. He wanted to deal with the problem by changing the Oracle shared memory allocation. With the agreement of W21 Mr Michael Todd Korkwoski of EDS and W25 Mr TSUI King Cheong (the Project Manager of AA), Mr Wainwright shut down FIDS in order to effect the change. He was then advised by Mr Michael Hobden, the hardware manager for EDS, that a Unix operating system parameter would only allow an insignificant increase in Oracle's memory allocation. He therefore brought FIDS up again without making the proposed change to increase the shared memory allocation, at about 10:45 am. Performance temporarily improved at first and then began to slow down as more MMI and Common User Terminal Equipment ("CUTE") users logged back in. Between 11 am and 1:30 pm, Mr Wainwright also noticed a small number of standard, transient Oracle locks that occurred and cleared. These locks were related to either CUTE or MMI workstations but resolved themselves before they caused sufficient delay necessitating termination of the workstation sessions.

10.38 When Mr Wainwright returned to PTB at midnight on 6 July, he was informed by a colleague, Mr Stefan Paul Bennett, that there had been more locks which Mr Bennett tracked down to MMI software errors. EDS then implemented the Unix and Oracle configuration changes. These changes affected only the host server and were not related to workstations. According to Mr Wainwright, the ORA-04031 error did not occur again. FIDS, however, slowed down again as the airport became busier in the morning of 7 July but the curing of ORA-04031 made the system stable throughout the day. Mr Wainwright remained at PTB until 11 am on 7 July but returned to PTB at 10:40 pm that evening. Thereafter until 11 July, he was regularly at PTB doing more work. On 10 July, there was a most significant locking problem between 3 and 4 pm, and changes were made to the system under System Change 109 in the early hours of 11 July 1998, which led to a significant breakthrough in resolving performance issues.

Section 3 : Remedial Measures and the Present Status

10.39 In his witness statement, W21 Korkowski of EDS wrote that there were two main problems relating to C381 FIDS host server operations in the first week after AOD: performance and database issues. To address the performance issues, EDS undertook actions to increase the amount of server resources installed that were allocated to the database and to eliminate unnecessary queries generated internally by the system. The performance issues were greatly reduced the night after AOD and eliminated by 11 July 1998. The database issues exhibited themselves intermittently due to several internal problems with the Oracle database that the FIDS system utilised causing database locking. The locking conditions can be eliminated temporarily by restarting the database. This problem was subsequently solved through changes to FIDS and TMS to bypass the Oracle features that were causing the problems.

10.40 There were four workstations in the ACC, two for TMS, one used as FIDS MMI and one a standby. According to W28 Yuen, on Day Three (8 July 1998) and Day Four, additional Random Access Memory ("RAM") was put into the workstations in ACC. The response time was improved but not significantly. However, TMS became more stable. The slow response was only improved significantly at the end of the first week after AOD. The green bar problem has not arisen since Day Three. On AOD, however, the appearance of green bars was not the major problem, because it annoyed operators but did not prevent them from carrying out their tasks. After W34 Derrick assisted in removing the green bars at around 2 pm, the real problem hindering input of data into TMS was the slow system response. TMS was too slow for the ACC operators to catch up with updating stand allocation on a real time basis.

10.41 W26 Cheung told the Commission her understanding was that on the night of AOD, EDS reconfigured FIDS and reset some parameters, to make the system go faster. On about Day Three, EDS also reduced the input refreshing rate of the screen. On about Day Five, EDS worked on the servers, and before that installed some RAM to the workstations. W27 Ms Yvonne MA Yee Fong, a Project Manager of AA's IT Department, gave evidence with W26 Cheung in a group before the Commission. W27 Ma clarified that the refreshing rate was reduced from 6 seconds to 45 seconds.

10.42 W27 Ma also told the Commission that since February 1998, AA had negotiated with Oracle Systems Hong Kong Ltd ("Oracle

Systems") to be AA's consultant to look into the health of FIDS and AODB, both of which used Oracle for their database. The Oracle consultancy was only agreed in late June 1998 and the consultants came into the new airport to start working on 29 June 1998. They then identified some problems with the Oracle database, some of which were rectified before AOD, but most of them were only fixed after AOD. W27 Ma told the Commission that the problems still not rectified by AOD caused some of the slow response and locking problems. However, as at 5 November 1998, all but one of the fixes had been done.

10.43 The witness statement of Ms Susan WONG of AA described the problems experienced with the Oracle database in greater detail. On the morning of AOD, certain Oracle errors were reported several times on FIDS workstations, and by about 10 am, certain MMI functions failed to proceed. The errors were generated by the inability of the Oracle database to find sufficient memory in the Database Shared Pool. The database was restarted at 10:39 am to clear up the Shared Pool. This specific problem was not encountered further that day. As a permanent fix EDS, on the recommendation of the Oracle consultants, reset the size of the Shared Pool and the related system parameters to a higher value and restarted the server and database to take account of the changed parameters on the night between 6 and 7 July 1998. No similar error has recurred since the change.

10.44 Mr Wainwright of EDS stated that one of the issues that he monitored was database locking. He briefly explained the three concepts central to the understanding of this issue, namely,

Alerts:	A mechanism to let one computer programme wake another up by signalling to it. Alerts make use of locking and therefore a programme which signals an alert and then gets stuck could cause the whole system to lock up.
Locking:	A standard database feature to preserve the integrity of records by which a process updating a record locks that record from updates by any other process until the update is complete.

Deadlock: A deadlock occurs when two different programmes try to lock the same resource in a different order and end up both waiting for each other indefinitely. Oracle will always cancel the last lock request of one programme to free the other programme. All Oracle locks acquired before the last lock request will remain until something is done to terminate the programme.

10.45 Ms Susan Wong also dealt with the locking problem. She said that locking is a normal feature of almost all database systems which allow multi-user access. It prevents other users gaining access to the particular database object whilst it is being accessed. When one user has finished processing a particular database object, it should be released to allow other users to work on it. When two or more processes allocate database objects required by each other, a deadlock occurs. The Oracle database has the capability to detect and resolve such deadlocks automatically. However, as this automatic process takes several minutes to operate, users requiring the deadlocked resource will have to wait which in turn will result in longer response time. There were the following significant deadlocking problems occurring on AOD:

(a) Table Storage Parameters. Certain deadlocks occurred as a result of insufficient settings on various table storage parameters from AOD. A table in the database stores a particular type of data record. If, as occurred in this situation, the table parameters were set too low, users would have to wait before being allowed access to the relevant table. On the recommendation of Oracle Systems, EDS carried out the necessary remedial actions on 17 July and 18 August 1998.

(b) WDUM and MMI processes. WDUM is a background process which defines the flight information sent to the FIDS MMIs to update the displays. A problem with this process occurred on AOD which seriously affected performance. Suggestions on application changes to prevent WDUM and MMI deadlocks were sent to EDS and were implemented on

10 July 1998. Similar deadlocking has not recurred since.

(c) SESSION_ALERTS Table. When an MMI is opened (known as a session creation), the SESSION_ALERTS table will be searched for obsolete records for deletion. Database errors occurred when the system tried to delete records from the table which prevented the operation of the session creation process. This was one of the causes that W27 Ma told the Commission, but the cause was identified only on 10 July 1998. Records within the table were truncated as a temporary measure, and MMI sessions resumed normal functioning. Permanent fixes were implemented by EDS towards the end of August 1998.

10.46 Ms Susan Wong's statement tallies substantially with what W27 Ma told the Commission. W27 Ma said that there was a shared pool problem relating to configuration of the Oracle database. That problem was fixed in the night between 6 and 7 July by EDS enlarging the shared pool and some parameters on the operating system level. In the night between 10 and 11 July, EDS caused the Oracle consultant employed by them to do three further things to improve the stability and speed of FIDS, as follows:

(a) Disabling the deletion of the SESSION_ALERTS table;

(b) Truncating the SESSION_ALERTS table, so that it would clean up the table every night, and before a permanent fix was implemented, AA's IT staff truncated the table every night; and

(c) Modifying the triggers in the TMS table to reduce the locking of the database of TMS/FIDS.

10.47 Ms Susan Wong also stated that one problem with the Oracle database was identified on 10 July which was not shown to have caused the performance problem on AOD, and that was eventually fixed by EDS on 23 August 1998.

10.48 Mr Ian CHENG, employed by Oracle Systems, was the supervisor responsible for monitoring the Database Administration Consulting Services delivered by Oracle Support Services. He arrived at the new airport at 7:30 am on AOD and was taken to AOCC by Ms Susan Wong at around 10:45 am after he had obtained his permit. He was told that the FIDS database was restarted with an increase on shared pool sizing at 10:39 am to resolve a shared pool problem since the shared pool allocation had been smaller than needed. He discussed shared pool sizing with EDS and recommended several Oracle parameters and features in order to avoid the recurrence of the shared pool problem. EDS informed him that they would raise certain Oracle and Unix parameters, restart the database to take into account the effect of the changes to be made on the night of AOD in order to implement a long-term solution.

10.49 Mr Cheng also stated the following:

(a) An Oracle error was encountered on 7 July 1998. The error occurred while a FIDS table was updated by a housekeeping job. The problematic Structured Query Language statement was examined and identified to be a problem on “consistent read on Oracle dynamic performance view”. The explanation and workaround were delivered to EDS and AA on the same day.

(b) From 5 to 10 July 1998, related deadlock trace files were discovered. From 6 to 9 July 1998, with the help of EDS, he studied the design and source code of TMS and MMI, and the trace files were collected. He concluded that the application had a potential deadlock, and at peak hours was causing three to four deadlocks per hour. Two workarounds were suggested by EDS to which Mr Cheng agreed. The first workaround was to prolong the frequency of MMI refresh rate from 6 seconds to 45 seconds, which would reduce the chance of encountering deadlocks between WDUM and MMI. He believed that this workaround was implemented around 8 to 9 July. The second workaround was to separate the transaction of MMI into two so that the

FIDS_ALERT_INFO and SESSION_ALERTS tables would not be locked or requested within one transaction to eliminate the factor of deadlock situation. This workaround was implemented on the night of 10 July 1998.

(c) An Oracle table has a transaction slot on each data block which allows the concurrent locking on the records within the data block by several processes. If the related parameter is set too low and there is no room for this transaction slot to grow, the subsequent transactions which require locks on this particular data block will have to wait until the occupied transaction slots are released by other processes. Some of the trace files indicated several tables encountered this problem, causing up to one deadlock per day, and recommendation was delivered on 13 July 1998 to EDS to solve this issue.

(d) From 10 July 1998, deadlocks on User Locks were found occasionally, perhaps one or two per day. This might have been due to a misbehaviour on releasing User Locks while using a particular package called DBMS_ALERT. The explanation and workaround were delivered on 13 July. EDS informed him that a new module would be implemented to avoid using DBMS_ALERT.

(e) Several Oracle internal errors were reported on 10 July while the SESSION_ALERTS table was being deleted. A known Oracle bug was identified and a patch was delivered on 16 July. After the application of the patch on 9 August, the symptom of the bug did not recur, but the errors were still reported. A new Oracle bug was discovered and another patch was delivered on 12 August 1998.

10.50 Mr Wainwright stated that during the night between 6 and 7 July 1998, EDS implemented configuration changes to Oracle and the Unix parameters and System Change 109 effected in the early hours of 11 July 1998 made a significant breakthrough in resolving performance issues. In its response dated 9 November 1998 to the Commission, EDS stated that the problem relating to the shared memory pool allocation was fixed in the early hours of 7 July, that the problem relating to WDUM Central Processing Unit, ie System Change 109, was fixed in the early hours of 11 July, and the memory of the workstations was increased between 11 and 21 July. It mentioned that there were three factors causing database deadlocking. Use of Oracle Alerts package and corruption of the FIDS SESSION_ ALERTS table were significant causes of locking not processing correctly, while deadlock on Exit of MMI was a minimal cause of deadlocking. In the early hours of 11 July, Preston made changes to TMS to eliminate the use of the Oracle Alerts package and a new release of TMS was tested and installed on 23 August 1998. EDS installed Oracle patches and made changes to the FIDS design to eliminate the reliance on the FIDS SESSION_ ALERTS table, and the work was performed in August ending with the design change being installed on 28 August. The deadlock on Exit of MMI was fixed on 11 July, under System Change 109. Once System Change 109 was carried out, performance of FIDS MMIs improved dramatically and has ceased to be an issue.

10.51 From AOD to early September 1998, many fixes or changes to FIDS were also implemented by EDS. The causes for the problems mentioned by W27 Ma and Ms Susan Wong were all rectified. Truncating of the SESSION_ALERTS table started on or shortly after 11 July. In the early morning of 11 July, an additional statement was inserted into TMS triggers to reduce the incidence of database locks caused by the users of the Oracle ALERTS package. Other changes were implemented for better operational usage, providing workarounds and enhancing diagnostic facilities, all for improving the stability and performance of the system.

10.52 W22 Mr Edward George Hobhouse described FIDS as workable on AOD and that by Day Three “TMS was almost there”, running as a planning and allocation tool, and that by Day Six, operation was comparable to the situation of the Kai Tak Airport. W21 Korkowski described FIDS as operating efficiently after the first week. W28 Yuen described FIDS’ functions and speed as acceptable about a week after AOD. While W26 Cheung agreed generally with W28 Yuen, she told the Commission that there was a downtime of FIDS on 19 September

1998 for almost 2 hours. She thought that FIDS, as a complicated and new system, ought to have a period of months for tuning.

10.53 Although such a complicated and sophisticated software system as FIDS must be treated conservatively, it appears from the evidence of all the parties concerned, namely, AA, GEC, EDS and Oracle Systems that as from late September 1998 most, if not all, of the problems that might affect the smooth functioning of FIDS had been resolved. W26 Cheung said that as FIDS was healthy albeit still having some problems, her confidence in FIDS was much higher when she gave evidence before the Commission than shortly before AOD. The Commissioners see little reason to doubt what W26 Cheung told them in this regard, as she appeared to them to be a very conservative person relating to IT matters. The evidence of all tends to suggest that there was nothing fundamentally wrong with FIDS, and that it has worked efficiently and smoothly since late September 1998.

CHAPTER 11

MAJOR PROBLEM – CARGO HANDLING

Section 1 : Importance of Cargo Handling in AOR

11.1 Right from the commencement of the new airport project, Airport Authority ("AA") recognised that efficient movement of cargo was an important aspect in the readiness of the new airport for operation. Section 6(2) of the Airport Authority Ordinance expressly provides that AA shall have regard to the safe and efficient movement of air cargo. The airport at Kai Tak was ranked amongst the busiest international cargo airports in the world and its efficient and speedy handling of air cargo had played a vital role in maintaining the vibrant economic growth of Hong Kong. The new airport was expected to achieve no less. Hong Kong Air Cargo Terminals Limited ("HACTL") was the only franchisee allowed to operate as a cargo terminal operator ("CTO") at Kai Tak, and through more than two decades of operation, it had established a reputation as a standard setter for efficiency and productivity amongst the airport communities worldwide. One can realise the significance of air cargo transportation to the new airport by merely looking at the fact that US$1 billion was invested by HACTL for the development of SuperTerminal 1 ("ST1"). For Chek Lap Kok ("CLK"), the monopoly was broken and two franchises were granted, one to HACTL and the other to Asia Airfreight Terminal Company Limited ("AAT"), and each would operate a separate cargo terminal. They were respectively assessed to cater for about 80% and 20% of the cargo capacity expected of the new airport. The readiness of the two cargo handling facilities was considered by AA and Government as a critical airport operational readiness ("AOR") issue right from the early stage of the development of the new airport.

11.2 The delay in the construction of HACTL's ST1 and AAT's premises gave rise to grave concern to AA and Government even before the announcement of airport opening day ("AOD") in January 1998. While AAT's franchise provided a capacity of processing 1,100 tonnes of air cargo per day by March 1998, HACTL's contractual completion date to provide 75% throughput capacity, ie, about 1,800,000 tonnes per annum out of the full capacity of 2,400,000 tonnes (excluding the annual capacity of 200,000 tonnes for the Express Centre), was 18 August 1998. HACTL was experiencing progressive and serious delay in the construction of ST1 and the subject was always on the agenda of the meetings of the AA Board and Airport Development Steering Committee ("ADSCOM"). The construction works of ST1 had slipped so much that throughout 1997 HACTL itself was worried about meeting the requirement of readiness in April 1998, the then target date. When AOD being 6 July 1998 was announced in January 1998, W7 Mr Anthony Crowley Charter, the Managing Director of HACTL and W2 Mr YEUNG Kwok Keung, the Deputy Managing Director of HACTL both expressed great relief for having three more months to get ST1 ready.

11.3 Since the contractual date of providing 75% capacity was 18 August 1998, HACTL had been operating on a best endeavours basis, ie, it promised to use its best endeavours or efforts to get ST1 and the cargo handling system ("CHS") ready for operation to handle a certain percentage of its yearly throughput capacity. At first when the target opening date was April 1998, HACTL stated openly and to AA and Government that it would be able to provide 50% of its full capacity in April 1998, and later that readiness date was pushed to the end of April 1998. Its full capacity being 2.4 million tonnes a year, 50% meant 1.2 million tonnes a year. In early 1998, HACTL's assurance given to AA and Government was that it would be able to provide 75% of its throughput capacity on AOD which was then known to be 6 July 1998. As far as New Airport Projects Co-ordination Office ("NAPCO") is concerned, although there had been constant concern over the readiness of the building of ST1, there was no suspicion that CHS had any problems. NAPCO knew all along that construction of ST1 suffered a series of slippages, with building works delays affecting equipment installation, commissioning and testing and impacting the installation and testing of Government department support systems housed in ST1. HACTL never reported any problem with CHS. For the last few months before AOD, NAPCO's primary concerns related to the installation of Government's systems and facilities at ST1 for Government departments, such as the Air Cargo Clearance System ("ACCS") to be used by the Customs and Excise Department ("C & ED") relating to cargo customs clearance. When AAT obtained its occupation permit ("OP") on 9 June 1998 and HACTL eventually obtained its temporary occupation permit ("TOP") on 3 July 1998, everyone was relieved. The main worry had gone. No one suspected that CHS would break down.

Section 2 : Cargo Handling on AOD

11.4 The condition of cargo handling on AOD can simply be described as chaos. An outsider can see that the ramp at the northern boundary of both ST1 and AAT's building was full of cargo, scattered all over a very large area. The most significant problem affecting AAT was that a large backlog of cargo was allowed to be built up which heavily congested its terminal and the interface area with the ramp. This led to delay in AAT's cargo handling and certain cargo being located. The problem might have been caused by many more cargo arriving at AAT than it had anticipated. AAT's staff, who began to work in a new environment and with a new system, simply could not cope. A lack of co-ordination between AAT and ramp handling operators ("RHOs") exacerbated the problem. AAT made arrangements with the nearby Airport Freight Forwarding Centre ("AFFC") to use the latter for breakdown, storage and collection of the backlog cargo, and from 18 July 1998 onwards, the severe congestion at AAT's terminal started to abate. This allowed AAT to process daily inbound and outbound cargo normally and without further difficulties. The backlog was cleared by 13 August 1998. The difficulties experienced by AAT and the impact thus caused were relatively small and manageable than HACTL's, not only because of the smaller size of its operation as compared with HACTL's, but also because its cargo handling system goes nowhere near the degree of sophistication as HACTL's. The rest of this chapter therefore focuses on HACTL's problems.

11.5 For the purposes of the inquiry, one needs to go inside ST1 to see what exactly was experienced by HACTL. For understanding the difficulties that were encountered at ST1 on AOD, it is necessary to have some appreciation of HACTL's CHS. CHS in ST1 is a very sophisticated system consisting of five levels, as follows:

(a) Level 5 – the Community System for Air Cargo ("COSAC 2") – which is the main computer system connected with outside systems like Flight Display Data Feed Services ("FDDFS") and Societe Internationale de Telecommunications Aeronautiques ("SITA"), etc and accessible by customers, airlines and other users while it is also linked to the lower levels of CHS;

(b) Level 4 – the Resources Management System ("RMS") – which manages resources such as availability and deployment of manpower, shifts of personnel, scheduled load requirements, etc, after analysing information from level 5 such as customers' instructions and flight information for the purpose of managing the resources at ST1, resulting in its giving commands to the lower levels of CHS in an optimum and best prioritised manner;

(c) Level 3 – the Logistic Control System ("LCS") – which takes orders from upper levels and possesses the intelligence of giving orders to the lower levels of CHS in accordance with the command of RMS or COSAC or it can give orders to the lower levels of CHS on its own independent from RMS or COSAC;

(d) Level 2 – the Programmable Logic Controller ("PLC") – which takes orders from the LCS and then operates the mechatronics; and

(e) Level 1 – the mechatronics of the CHS which are the mechanical, electrical and electronics equipment which perform the work of handling cargo, including transferring cargo on conveyor belts and automated transfer vehicles ("ATVs"), putting cargo into the storage compartment and retrieving cargo therefrom.

A diagram showing the CHS with its five level is at **Appendix XII**.

11.6 The mechatronics of the CHS consist of two main components, namely, the Container Storage System ("CSS") and the Box Storage System ("BSS"). Both CSS and BSS have stacker-cranes which pick up cargo from ATVs or conveyor belts and lift it to the assigned compartment for storage and retrieve it from the compartment whenever needed. W2 Yeung emphasised that the mechatronics, being the lowest arm of the 5-level CHS, was the most important element in the handling of cargo. Without them, the whole CHS could not work, while they could work alone even if the higher levels of CHS all failed. Although LCS is a single computer system, it is linked separately to CSS and BSS, giving orders through PLC for the two mechatronics systems to perform work independently or collectively.

11.7 CHS has five basic operation modes utilising different combinations of the sub-systems, namely,

(a) optimised mode (automatic mode): all levels are operating together with RMS operating at full capacity planning for LCS;

(b) inventory mode (automatic mode): COSAC and LCS operating together but without RMS; messages defining cargo locations are exchanged directly between COSAC and LCS;

(c) online mode (automatic mode): LCS, Equipment Motion Control ("EMC") and PLC are working together, without RMS and COSAC; LCS continues to update COSAC and RMS with inventory information as to the locations of Unit

Load Devices ("ULDs") and bulk cargo;

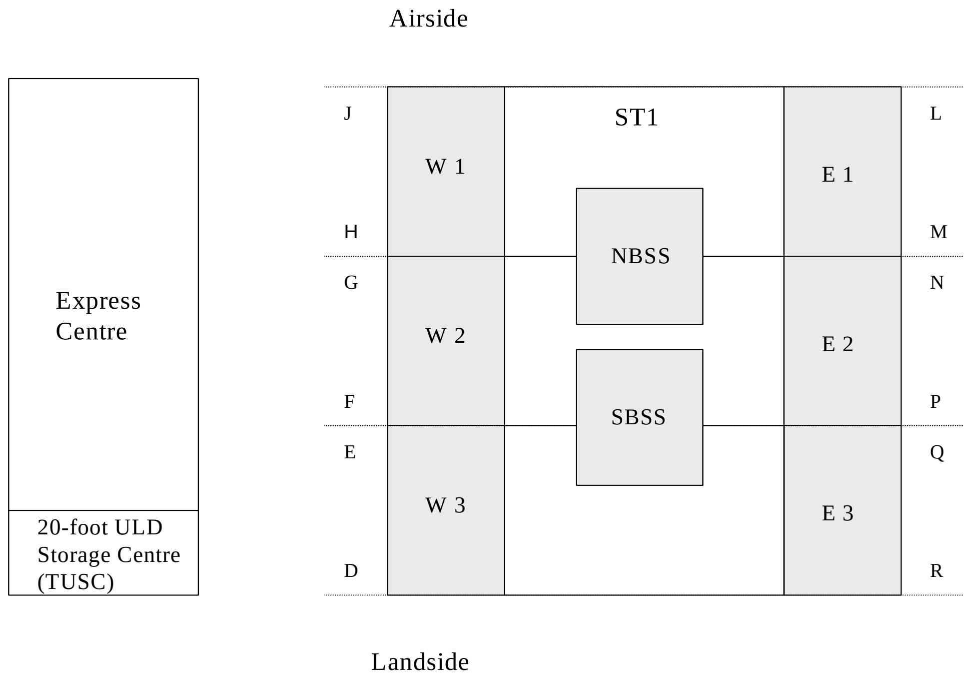
(d) offline mode: the machinery is under the control of the Interchange Server ("IS") system and containers are transported based on the default routings embedded in the PLC software;

(e) manual mode: EMC and PLC are used as stand-alone with no information to LCS, COSAC and RMS; the different units of the machinery (sensors, drives, switches, etc) are still linked and interacting; and

(f) maintenance mode: this is a sub-mode of manual mode where each unit is controlled individually, eg, in maintenance mode it is possible to control drives (such as to move a ULD) without interference of messages sent from the sensors.

11.8 It is to be noted that when manual mode is operated, there will be no automatic update of inventory information contained in COSAC and RMS as to the locations of ULDs and bulk cargo. In such circumstances, the operator will have to input data into the Multi-Functional Terminals ("MFT") to update the inventory.

11.9 CHS is a modular design in that each part of it can be operated as an individual and independent module without having to rely on another module. Not the entirety of CHS was required to operate in order to process the projected amount of cargo on AOD, and indeed, not all the equipment of CHS was fully commissioned. CSS was built on the east and west sides of ST1, and on AOD, the whole of the west side, namely, W1, W2 and W3 were to be used together with a part of the east side, E1. BSS is, on the other hand, divided into north and south, and both the North BSS and South BSS would be used on AOD. Set out hereunder is a sketch showing the positions of the various parts of CHS.



11.10 The problems with ST1 and CHS on AOD and the period thereafter can best be presented in the form of a chronology. The chronology shown below is adopted from that prepared by Dr Ulrich Kipper, one of the experts appointed by the Commission, and is mainly based on a substantially contemporaneous chronology prepared by HACTL which had been furnished to the Commission and supplemented with other evidence received by the Commission. The chronology summarises the events related to ST1 and CHS on AOD and shortly before and after. For easy reference regarding the contents of the chronology in this report, a reference number prefixed by "AODH" is assigned to each of the events listed.

Date	Time	Event
2 July		[AODH 1] Twenty-foot ULD Storage Centre ("TUSC") was flooded during the Fire Services drencher test, and the Elevating Transfer Vehicle ("ETV") was damaged and therefore, not available on AOD.
3 July		[AODH 2] HACTL started to accept cargo in ST1; minimal cargo were accepted. 291 empty ULDs were relocated from Kai Tak to ST1.

Date	Time	Event
4 July		[AODH 3] Few cargo acceptance: bulk 7 consignments, 118 pieces, 2,130 kg; prepacked 33 ULDs; 109 empty ULDs were relocated from Kai Tak to ST1.
5 July		[AODH 4] Few cargo acceptance: bulk 139 consignments, 2,186 pieces, 46,216 kg; prepacked 519 ULDs; 1,023 empty ULDs were relocated from Kai Tak to CLK of which 655 were moved during the overnight period.
6 July	Whole day, general	[AODH 5] Most areas of ST1 were available on AOD, and it was expected that this would deal with anticipated load.
		[AODH 6] Zones functional: Zones L and M, entire Perishable Cargo Handling Centre ("PCHC"), E1 (Zones L and M), W1, W2, W3.
		[AODH 7] On AOD, all levels of computer systems were operational.
		[AODH 8] Manual issue of truck dock tickets due to unavailability of VIS (ie, Vehicle Information System) and Trucks Control Office ("TCO") facilities.
		[AODH 9] In the field (of an FDDFS message) "estimated_date_atc" HACTL received only a few messages, insufficient to be able to update COSAC with the necessary information for RMS to effectively plan operations and send instructions via LCS. (As a comparison, HACTL received approximately 10,000 messages from FDDFS per day in September 1998.)
		[AODH 10] Many units were unable to be located because of faults in the system. Many flights left without carrying their designated cargo for the whole day.
		[AODH 11] Problems with both BSS and CSS noticed on AOD.
		[AODH 12] Many of the empty ULDs were put into CSS in the morning of 6 July 1998 because they had arrived with the last flight. There were reports of slow CSS response. Both placing cargo into the empty ULDs and

Date	Time	Event
		the preparation of cargo for despatch were slow.
	00:00	[AODH 13] Continued from the late evening, prepacked ULDs were received at W1, ie, Zones H & J. There were occasional ATV faults which interrupted the reception process. However, LCS and CSS were generally operational.
		[AODH 14] Due to long order processing time needed for a storage order, all export loaded stacker boxes accepted on 1/F were transferred to 3/F and 4/F workstation floor for temporary staging via the cargo lift.
		[AODH 15] After 00:00 hours, when Flight Data Display System ("FDDS") became operational there appeared to be no information of real practical use.
		[AODH 16] The Private Automatic Branch Exchange ("PABX") system was not functioning properly. Phone numbers were wrongly directed. Staff started using their own mobile phones for communication.
	00:40	[AODH 17] Information Services Department ("ISD") informed Operations Project Team ("OPT") that FDDS would not be available, and AA would start faxing flights' estimated time of departure ("ETD")/actual time of departure ("ATD") and estimated time of arrival ("ETA")/actual time of arrival ("ATA") to ISD's fax machine later in the morning.
	02:00	[AODH 18] A CSS stacker crane in Zone J had stopped.
		[AODH 19] Shift Manager, W19 Mr TSUI Shek Chui, felt that it was necessary to override the automatic system and operate in manual mode at Zone J only.
	02:20	[AODH 20] Stacker crane SC0J8 was switched to manual mode of operation.
		[AODH 21] About 30 CSS orders designated for CSS9J were found queuing for processing. The processing then took about three hours to complete instead of the normal one hour.
	03:00	[AODH 22] Control Systems Development Group ("CDG") identified that stacker crane had made incorrect

Date	Time	Event
		reservation, causing some orders to be unprocessed. A malfunction was reported at stacker crane no. SC0J8 due to an incorrect “storage compartment reservation data” within LCS. The presence of a software “bug” was the suspected culprit. CDG immediately carried out recovery procedures to try to re-activate SC0J8 so that appropriate orders could be handled.
	04:00	[AODH 23] Build-up activities in progress, but the build-up staff needed to search for the cargo in loaded stacker boxes at 3/F and 4/F. ULDs for export were reported as “urgent” by OPT users. Decision by OPT to operate SC0J8 manually, creating inventory inaccuracies through bypassing automatic equipment control. Inaccuracies were either due to inputting incorrect information or omitting to input certain information. Such inaccuracies were also caused by delays in the keying in of data.
	06:00	[AODH 24] A lot of completed ULDs were waiting for ATV pick up after LCS-CSS order had been raised. System Support Team was called for assistance.
	07:40	[AODH 25] The backlog of cargo had increased.
	08:00	[AODH 26] A lot of units were still waiting at workstations for ATV pickup.
	09:00	[AODH 27] Most of the stacker cranes (other than SC0J8) were being operated in manual mode resulting in further inventory inaccuracies.
		[AODH 28] From 09:00 to 22:00 on 7 July maintenance staff observed substantial number of faults in the operations of CHS. They tried to keep CHS running continuously, to reset and to restart the affected equipment, whenever possible.
	10:00	[AODH 29] More and more outbound ULDs accumulated at workstations.
		[AODH 30] ATVs of Level 3 and Level 4 workstation floors were found unresponsive to serving incoming ULDs that had arrived at the power conveyers. Engineering Department (“ENG”) staff were requested to operate the

Date	Time	Event
		ATVs manually.
		[AODH 31] Inbound ULDs were spread over the whole of ST1's northern interface with the ramp.
		[AODH 32] Operators tried to use MFT to initiate transfer orders. Some operators appeared unfamiliar with MFT user screens, making the situation worse. They were handling "live" operations in a new working environment at ST1 for the very first time. Orders initiated by MFTs were therefore either stopped or rejected as a result of LCS's "routing" and "reachability check" functions. Despite efforts being made by the CDG to rectify the inventory data inaccuracies, more inaccuracies were simultaneously caused by manual operators.
	12:00	[AODH 33] A few inbound units received on 3/F and cargo breakdown commenced.
		[AODH 34] Due to the poor performance of LCS/BSS, large amount of stacker boxes with export cargo could not be stored back in system. Therefore, loaded boxes were temporarily stowed at the eastern side truck docks.
	14:00	[AODH 35] A lot of stacker boxes or consignments could not be located upon cargo build up.
	14:30	[AODH 36] All LCS supervisory functions were unavailable for 1 hour and 15 minutes.
	15:00	[AODH 37] Large amount of perishable cargo subject to immediate release could not be located at the airside.
		[AODH 38] Meeting called by W12 Johnnie WONG Tai Wah, General Manager-Operations, with W14 Ms Violet CHAN Man Har, System Manager, W20 Mr Tony KWAN To Wah, General Manager-Engineering and W10 Mr HO Yiu Wing, Project Manager-Control. Everyone reported problems. Determined to enforce shop floor staff to actively report problems to the support teams. The Meeting also decided to conduct physical ULD inventory check starting midnight.
	15:30	[AODH 39] The prepacked units acceptance point at W1 (ie, Zones H & J) experienced frequent faults due to weight discrepancy at transfer vehicle TVOJ2.

Date	Time	Event
	16:00	[AODH 40] LCS-CSS associated equipment were all operated under manual mode.
	17:00	[AODH 41] A meeting was held between CDG, ENG and OPT. The following were agreed: [AODH 42] (a) ULD inventory check would begin at 00:01 of 7 July and end at 02:00 7 July. During that period, storage of ULD into CSS should be prohibited; [AODH 43] (b) After the inventory check all CSS equipment (in west wing) would be put back to automatic mode. ATVs and building cargo hoists in W1 would be partially put back to automatic mode, but ATVs and building cargo hoists of W2 and W3 would remain manually operated by ENG; [AODH 44] (c) Operations Department ("OPS") would adopt fixed path for transferring ULD between levels 3 and 4 and ground level of airside building, in which cargo hoists would be used.
	18:00	[AODH 45] CDG and OPT agreed to suspend optimised mode of operations. That was to detach RMS and LCS-CSS linkage. No retrieval orders could be initiated by RMS automatically for export ULDs. Operations staff were required to initiate retrieval orders themselves.
	19:00	[AODH 46] Operations Computer Project Manager ("OCPM") had sought for permission from General Manager of ISD and General Manager of OPT to revert the system to inventory mode.
	20:00	[AODH 47] Large crowds of consignees who were holding Shipment Release Forms ("SRF") with dummy storage locations were waiting for their cargo at the first floor truck docks.
	22:30	[AODH 48] ULD inventory check began at W2 and W3.
7 July	Whole day, general	[AODH 49] On airside there was a backlog of inbound cargo which had been dumped at the northern side of ST1. Operations were being conducted manually as the

Date	Time	Event
		automatic system of CSS had apparently failed.
		[AODH 50] There were various recorded faults in the computer terminal. Staff were therefore required to physically look for the required cargo in all compartments, thus slowing down the process significantly.
		[AODH 51] On landside, boxes could not be entered into BSS system because of the breakdown and were placed outside the truck dock area.
		[AODH 52] During the course of 7 July, CDG performed software updates to enhance LCS (enhanced logging and control software functions).
	03:30	[AODH 53] ULD inventory check at W2 and W3 completed. Update of LCS-BSS inventory records to correspond with LCS-CSS records. Inventory check at W1 Zone J began with Zone H continued to operate under automatic mode.
	04:00	[AODH 54] A lot of inbound units from 6 July inbound flight still outstanding and needed to be broken down. Build-up outbound units waiting at workstations were not picked up by ATVs.
		[AODH 55] CDG found that a batch of ULD records in LCS-CSS was deleted by a hidden system event.
	04:30	[AODH 56] Inventory check at W1 Zone J completed; check at W1 Zone H began.
	05:00	[AODH 57] Acute shortage of dollies. The interface area was jammed with dollies with inbound and outbound ULDs.
	05:45	[AODH 58] The compartment inventory database was found corrupted. All CSS zones were manually operated.
	06:00	[AODH 59] LCS-CSS compartment inventory as of the image 6 July 23:00 restored by CDG. From this point onward, all LCS-CSS and associated operations were run under manual mode.
		[AODH 60] A great number of boxes and bins were dispersed around the warehouse floors as a result of

Date	Time	Event
		LCS-BSS slow response to pick up boxes and bins.
	06:15	[AODH 61] Due to the continued disruption in CHS operations, more than 50 trucks were waiting for pre-packed cargo delivery.
	07:00	[AODH 62] Large number of trucks delivering prepacked ULDs were waiting to be served. The trucks were instructed to divert to Kai Tak.
	08:00	[AODH 63] Due to delay in perishable cargo release, large amount of perishable cargo from inbound flights of 6 July was not collected by the consignees at PCHC truck docks.
	10:00	[AODH 64] AA officers approved the marking of the north interface area with staging zones and lanes.
	12:00	[AODH 65] Meeting with airline representatives and C & ED to discuss the situation.
	15:00	[AODH 66] HACTL announced a 24-hour embargo on export bulk cargo and import cargo on passenger flights with the exception of perishables, strong room cargo, newspapers, livestock and life saving materials ("urgent items").
	18:00	[AODH 67] Prepacked cargo for export freighters and inbound cargo from freighters other than urgent items was to be processed at Kai Tak.
8 July		[AODH 68] HACTL imposed a 48-hour embargo except urgent items.
9 July		[AODH 69] TUSC recovered and back in operation.
		[AODH 70] HACTL imposed a 9-day moratorium on all cargo on all aircraft except inbound urgent items.
		[AODH 71] HACTL started to clear out ST1 as (1) cargo release would be quicker at Kai Tak; (2) clearance of CSS and systems would allow HACTL to rectify the problems with CHS and clean equipment, machinery and the

Date	Time	Event
		building site of ST1.
10 July		[AODH 72] BSS suspended operation. [AODH 73] HACTL did not know how long recovery would take; might take months. By then, HACTL decided to concentrate on CSS, as it was needed for export processing, and BSS less important as BSS was functional at Kai Tak.
14 July		[AODH 74] In a meeting, Mannesmann Dematic AG Systeme (“Demag”), the supplier of CSS, put forward a proposal to HACTL to develop an offline mode based on the operations if PLC and the mechatronics to enable CSS to operate only levels 1 and 2 of CHS.
13 Aug		[AODH 75] BSS resumed full operation.
24 Aug		[AODH 76] ST1 was back to full import and export operation.

11.11 Shortly after midnight on 5 July 1998, there were a large number of ULDs, empty or otherwise, that had been transferred from Kai Tak to ST1. HACTL was trying to store these ULDs in CSS but from W7 Charter’s evidence, the task was not completed even as late as midday on AOD. It is clear from the chronology that in the small hours of AOD, stacker crane SC0J8, one of the three stacker cranes operating that day for CSS, stopped [AODH 18] and Zone J had to be operated in manual mode [AODH 20]. The 30 orders designated for CSS9J had to be processed manually which took about three hours that could have been completed in less than an hour under automatic mode operation in normal circumstances [AODH 21]. The manual mode of operation created inventory inaccuracies for upper levels of CHS, namely, LCS, RMS and COSAC. The inaccuracies were caused by the operators keying in inaccurate information of the location of the ULDs, or their delay or omission in inputting the data [AODH 23,32]. More and more areas of CHS responded slowly to orders and had to be operated in manual mode. As a result, more and more inventory inaccuracies were created [AODH

27]. The manual mode of operation worked much more slowly than the automatic mode, and backlogs of unprocessed cargo were increasing [AODH 29]. The import cargo on the ramp delivered by ramp handling operators ("RHOs") were also building up [AODH 31]. A decision was taken to manually check the inventory [AODH 38,42], which was performed in the small hours of 7 July 1998 [AODH 48,53,56], but by an inadvertent application of a programme used for testing, the inventory was deleted [AODH 55,58]. This gave rise to serious suspicion that there was something gravely wrong with the systems, and an embargo was declared at 3 pm on 7 July 1998 [AODH 66], while HACTL was considering ways to recover. The details and the analysis of the causes for the problems are contained in Chapter 14.

Section 3 : Remedial Measures and the Present Status

11.12 As can be seen from the chronology above, the embargo was prolonged from 8 July to 18 July 1998. In fact, apart from the TUSC, the Express Centre, which was part of ST1, did not experience any difficulty on AOD or thereafter. The Express Centre contains strong room facilities, the HACTL Express module to process onboard courier material and HACTL's three express operator tenants, UPS Parcel Delivery Services Limited, DHL International (Hong Kong) Ltd. and TNT Express Worldwide (Hong Kong) Limited. The facilities in the Express Centre never stopped operation. The Express Centre's 200-position container handling system was fully operational, enabling HACTL to handle in a programmed manner approximately eight outbound freighter loads per day. On 16 July 1998, HACTL announced a four-phase recovery programme, as follows:

> Phase One: From 23:59 on 18 July 1998, HACTL would begin to process 50% of the projected daily tonnage of both imports and exports. Cargo to be managed would be restricted to prepacked cargo on freighters only. During this phase, imports would be processed at Kai Tak except import urgent items would continue to be handled by ST1.
>
> Phase Two: By the end of July, operations would be extended to

cover prepacked export cargo on both freighters and passenger aircraft and all import cargo on freighters and passenger aircraft, representing not less than 75% of the projected total daily tonnage.

Phase Three: From mid-August, the service would be fully operational using both ST1 and Terminal 2 at Kai Tak. HACTL would process 100% of projected tonnage of both imports and exports, with operations extended to cover prepacked and bulk export cargo.

Phase Four: All export and import cargo operations would be handled by ST1 at the end of August 1998.

11.13 The four phases of recovery were carried through quite efficiently and indeed, ST1 apparently recovered fully on 24 August 1998, ahead of the planned time, when it started to handle all cargo, imports and exports. The details of the history of ST1's recovery are evident from the press releases and the statements made by HACTL from time to time. The periods of the moratoria imposed by HACTL on cargo that it would handle and the details of the recovery programme are summarised below:

Date of Announce -ment	**Date or Period Covered**	**Type and Quantity of Cargo**	**Place of Processing**
6 July		ST1 opened	ST1
7 July	24 hours	Embargo on all export bulk cargo and imports on all passenger freighters except urgent items	
	From 7 July	Prepacked export cargo	Terminal 2
		Freighter inbound cargo	Terminal 2
		Export and import urgent items	ST1

Date of Announce -ment	Date or Period Covered	Type and Quantity of Cargo	Place of Processing
8 July	48 hours	Arrangements put in place on 7 July extended	
9 July	9 – 18 July	Moratorium on all cargo on all aircraft, except inbound and outbound urgent items	
		Inbound and outbound urgent items (approximately 10% of all cargo)	ST1
		The cargo currently at ST1 would be moved to Terminal 2 for storage and distribution	Terminal 2
15 July	From 15 July	HACTL eased restrictions to accept outbound cargo on narrow bodied aircraft	Terminal 2
		The Express Centre with strong room facilities and with 3 express operator tenants, UPS Parcel Delivery Services Limited, DHL International (Hong Kong) Ltd. and TNT Express Worldwide (Hong Kong) Limited was fully operational	ST1
		Import perishables accounted for about 319 tonnes of the total cargo handled in ST1	ST1
		HACTL able to process approximately 1,400 tonnes of cargo per day out of an expected daily load of 4,000 tonnes	ST1 and Terminal 2

Date of Announce -ment	Date or Period Covered	Type and Quantity of Cargo	Place of Processing
		All of the over 2,000 containers previously held in ST1 CSS had been transported to Kai Tak, by using barges and trucks	Terminal 2
16 July	From 16 July	HACTL able to process over 1,900 tonnes of cargo per day	ST1 and Terminal 2
		HACTL announced four-phase recovery programme for air cargo services using both ST1 and Terminal 2 in Kai Tak	
24 July	From 18 July	HACTL had been processing an average of 2,520 tonnes of cargo per day	ST1 and Terminal 2
	From 24 July	HACTL started to accept one pallet of general cargo per inbound passenger aircraft, ie, an addition of about 300 tonnes of cargo per day. With the perishable cargo, HACTL would be handling over 30% of the projected daily import tonnage from passenger aircraft	ST1 and Terminal 2
		HACTL also started to accept some prepacked pallets for a limited number of outbound passenger flights	ST1 and Terminal 2
28 July	From 21 July	HACTL was able to handle an average of 2,708 tonnes of cargo per day using	ST1 and Terminal 2

Date of Announce -ment	Date or Period Covered	Type and Quantity of Cargo	Place of Processing
		both ST1 and Terminal 2	
	From 29 July	HACTL began to process two pallets of general cargo per inbound passenger aircraft. HACTL brought in 33 more trucks with roller beds stripped out of Terminal 1 at Kai Tak welded onto the trucks to make up a fleet of 200 to handle the increased inbound workload	Terminal 2
29 July	From the week before	Accepting 3 export pallets per flight for a limited number of passenger aircraft	Terminal 2
	From 30 July	HACTL launched full resumption of all inbound cargo handling services, accelerating the recovery plan for all inbound cargo by about 24 hours. All imports handled at Terminal 2 with the exception of urgent items	Terminal 2
		Import and export urgent items	ST1
6 August	From the week before	The tonnage handled by HACTL had been at 80% of normal levels	ST1 and Terminal 2
	From 9 August	HACTL would handle on all outbound passenger flights 2 pallets, either prepacked or built up by HACTL, plus 500 kg of loose cargo	ST1 and Terminal 2
	From 11 August	Cargo on all Cathay Pacific Airways Limited (“Cathay Pacific”) inbound flights, both passenger and freighter,	ST1

Date of Announce -ment	Date or Period Covered	Type and Quantity of Cargo	Place of Processing
		would be handled at ST1 (Cathay Pacific accounted for more than 80% of Hong Kong's total transshipments last year)	
	From 15 August	HACTL would accept all export cargo and processing would be at either ST1 or Terminal 2	ST1 or Terminal 2
13 August	From 12 August	HACTL had handled all Cathay Pacific inbound cargo	ST1
	From 14 August	HACTL uplifted the remaining partial restrictions on outbound cargo for both passenger and freighter aircraft	ST1
		HACTL would handle all outbound air cargo	ST1
		All inbound cargo from airlines other than Cathay Pacific would be handled and processed at Terminal 2	Terminal 2
		Phase Three of recovery programme completed	
18 August	From 14 August	HACTL had been handling all outbound cargo for all flights at ST1	ST1
		Inbound cargo from aircraft, both passenger and freighter of China Airlines Ltd., Thai Airways International Public Company Limited, Air Hong Kong Limited, Japan Airlines Company Limited, Korean Air Company Limited and Eva Airways	ST1

Date of Announce -ment	Date or Period Covered	Type and Quantity of Cargo	Place of Processing
		Corporation was processed at ST1	
	On 18 August	Certificate of Operational Readiness issued	ST1
	From 18 August	ST1 handled 90% of all HACTL's cargo, and the remainder, processed at Terminal 2, would be transferred to ST1 by the end of August 1998	ST1 and Terminal 2
20 August	From 24 August	HACTL would handle all cargo at ST1	ST1
24 August	From 24 August	HACTL was handling all cargo at ST1 The four-phase recovery programme which began on 18 July 1998 was completed, some 8 days ahead of time	ST1

11.14 Nothing of note happened between 24 August 1998 and 15 October 1998 although as late as mid-September 1998, Hongkong Association of Freight Forwarding Agents Ltd and a few individual freight forwarders still wrote to the Commission to state that their cargo handled by HACTL were missing. However, the Commissioners believe that because there were only a few of such complaints, HACTL's performance as CTO was generally satisfactory as from 24 August 1998, and the complaints were a legacy of the confusion and deficiency that plagued ST1 on AOD.

11.15 On 15 October 1998, there was a structural failure of a section of ST1's power distribution system linking ST1 to a local substation causing disruption to ST1's operation. A large section of the ceiling suspended bus-bars and cables used in the distribution of commercial power to certain parts of the building collapsed around 6 am on 15 October 1998, cutting power to mainly the eastern half of the terminal building. This resulted in a number of airline offices losing power, limiting their ability to communicate with counter-parties required to be informed concerning cargo movement, both in and out of ST1. The power failure affected ST1's operational efficiency and slowed down the processing time for some types of cargo. The Express Centre and the PCHC were operating normally. Temporary power was restored to the airline offices for operating computers, telephones and faxes some 12 hours after the failure, and other temporary power measures were used to restore power to other affected areas. The water pumps servicing the fire hydrants and the drencher systems were not affected. Power supplies to the pumps servicing the sprinkler systems were restored by 10 am on 17 October 1998. Whilst the stacker cranes in zone E1 of the terminal continued to be energised in spite of the bus-bar problem, the airside interface of E1 was cut off from power until temporary power was made available by 2:30 pm on 17 October 1998. The sub-systems peripheral to the E1 CSS remained without power until noon on 21 October 1998. This, whilst enabling HACTL to deal with the airside load without any reduction in capacity, rendered it inefficient for HACTL to process the inbound load as the overall build-up and breakdown facility within the terminal was reduced to a little over 60 % instead of 75%. As a result, some amount of outbound cargo shutout from flights had to be dispatched later in the day or on the next flight on the following day. There was also some delay to the breakdown of inbound load which led to a slower service on the landside. Close dialogue was maintained with customers throughout the period and operations remained under reasonable control. Permanent power for air-conditioning and full lighting in the offices was restored on 20 October 1998 and all other affected areas of ST1 were connected with permanent power on 22 October 1998. HACTL's engineers and engineering consultants were satisfied that collapse of the remaining parts of the network was unlikely as its support was different from that of the collapsed portion. The exact cause of the collapse of the ceiling suspended busbars is not yet known. Binnie Consultants Limited have been appointed by HACTL to investigate into the incident.

11.16 The reasons given by HACTL as to how to rectify the problems it encountered can be gleaned from its early press releases after AOD.

(a) 7 July: “The impact of the high volume of ULDs moved from Kai Tak for entry into CSS at ST1 has resulted in inaccuracy in our ULD inventory.” “We have also encountered computer system difficulties. We now have to buy time to rectify these system problems.”

(b) 8 July: “… at the same time (of taking advantage of our facilities at Kai Tak) allowing our engineers and contractors adequate time to rectify current hardware and software problems with our Box Cargo Storage Systems.”

(c) 9 July: “… a moratorium will assist the company in rectifying software and mechanical problems which have impacted upon the efficiency of the building’s operation.”

(d) 10 July: “It (the moratorium) will enable us to address and deal with software and minor electrical and mechanical equipment problems which have not enabled the ST1 to operate at the levels of efficiency needed to deal with inbound and outbound cargo demands.” “When we restart operations we will build up gradually and therefore will have to limit and control the inbound and outbound flow of freight. The use of Terminal 2 at Kai Tak for import handling and distribution is likely to continue for a few months.”

(e) At a meeting on 15 July 1998 on cargo handling operations between HACTL and Government at Chief Secretary’s Office: FS (Financial Secretary) asked about the progress with sorting out the “bugs”. Both W7 Charter and W2 Yeung suggested that computer software was not the main problem. Rather it was the electrical and mechanical faults caused by the environment of a building site. W2 Yeung recounted that the computer system never really ceased to work since Day One but because of failures in the mechanical system, workers were forced to go manual on the CHS and in the process mucked up the database and wiped out memories inadvertently.

(f) HACTL ST1 Operational Recovery Strategy dated 15 July 1998 reads: "Operations resumption as from 2359 hours 18th July will commence on the basis of the use of off-line mode using PLC controls. This is to minimise the effect of a possible high rate of equipment faults on the performance of higher modes of controls, which whilst delivering more operational efficiency, will carry higher risks." "To further minimise our risk, we will concentrate our operations restart initially based on CSS resources. We will then introduce operations requiring automation of BSS." "The reason for this decision (to commence with pre-packed cargo handling using CSS only) is to avoid the use and therefore the risk and burden of managing BSS, during the restart operation so that management and technical attention can focus solely on CSS initially." "This (the reception and processing of export bulk using BSS) will be dependent on the availability of BSS which by then will have been checked out and be in a position to support a stable operation."

11.17 From all the press releases and public statements made by HACTL, the Commissioners can identify the progress of ST1's recovery. Yet it can be noticed that as from 15 July 1998, HACTL had altered from their openly stated positions of "computer system difficulties", "current hardware and software problems", "software and minor electrical and mechanical equipment problems" to "computer software was not the main problem", "it was the electrical and mechanical faults caused by the environment of a building site" and "the computer system never really ceased to work since Day One". The course of the inquiry conducted by the Commissioners was hindered by the fact that HACTL was not too forthcoming with the actual reasons that caused the difficulties at ST1. The Commissioners therefore feel hesitant about what had actually been done by HACTL to rectify the problems with CHS. They can only base their conclusions as to the causes of the breakdown of ST1 from the evidence of Murata (the contractor for BSS equipment) and Demag (the contractor for CSS equipment) and HACTL's press releases. The contents of the press releases are reliable because they would have been acted upon by air cargo owners, freight forwarders and airlines in their use of ST1's services. The causes for the problems and the responsibility for them can be found in Chapter 14.

CHAPTER 12

THE OTHER MAJOR PROBLEM AND MODERATE PROBLEMS

Section 1 : The Other Major Problem : Baggage Handling

12.1 The Baggage Handling System ("BHS") at the new airport is one of the most advanced systems in the world. It is a centralised, highly automated system controlled by computer and incorporating a high level of security. It has three functional areas – departures, arrivals and transfers.

12.2 Departing passengers at the new airport will check-in their baggage at check-in desks in the Departures Hall on Level 7 of the Passenger Terminal Building ("PTB"). At the check-in desks, baggage will be labelled by airline staff and put on the conveyors to go to the Baggage Hall. Baggage that cannot be safely conveyed, such as soft bags and bags with straps, will be placed in plastic tubs before being put on the conveyor. Oversize or out-of-gauge ("OOG") bags are taken by airline staff down to the Baggage Hall at Level 2 via the OOG lifts. The baggage then goes through sortation and security screening. Upon check-in, conveyors will take the baggage down into the Baggage Hall where one finds the BHS equipment and machinery. Check-in can also be done at the In-Town Check-In desks at the two major Airport Railway ("AR") stations. These baggage will then be transferred to the Baggage Hall and be injected into the system. In the Baggage Hall, the automated sortation system will direct the baggage to the appropriate flight laterals. At these laterals, which are effectively collection points for flight-sorted baggage, ramp handling operators ("RHOs") will transfer the baggage to containers which are then taken to the aircraft by road vehicles for loading onto the aircraft.

12.3 Arrival baggage is unloaded from aircraft by RHOs and brought by road vehicle to the conveyor loading stations, located in the Baggage Hall. RHOs will then transfer the baggage onto conveyors that take it to the reclaim units or carousels in the Arrivals Hall on Level 5. Arrival passengers will be directed to the particular carousel, through information displayed on liquid crystal display ("LCD") boards, to collect their baggage. Transfer baggage is collected from the aircraft in a way similar to arrivals baggage but is injected into the Departures sortation system. From there, it is treated as departure baggage and automatically directed to the correct flight laterals.

12.4 The departure/transfer machinery is independent of the arrival machinery. The former consists of a large and complex systems of conveyors, scanners and laterals. The latter consists of feeder conveyors in the Baggage Hall which link up with the carousels in the Baggage Reclaim Hall ("BRH").

12.5 BHS sorts departure and transfer baggage automatically and routes them to the correct departure lateral for collection by RHOs who will then dispatch the baggage to the appropriate aircraft on the apron. The sorting is done through the reading by BHS of the 10-digit barcoded licence plate number on the baggage label printed by airlines and by looking up the corresponding Baggage Source Message ("BSM") in the BHS Sort Allocation Computer ("SAC"). BSM has been produced and transmitted to BHS by the airlines via the Common User Terminal Equipment ("CUTE") during check-in. If the baggage label is not read at the automatic coding station, it will be diverted into a no-read loop where the baggage will be read by a staff at the manual coding station. If the baggage is late or it cannot be sorted by automatic or manual coding, it will be sent to the problem bag area where it will be removed and dealt with by Swire Engineering Services Ltd ("SESL") staff and RHOs who will take the baggage to the appropriate aircraft.

12.6 Where departure bags miss their flights (which have departed or closed), or have labels that cannot be read by either automatic or manual coding, or cannot for some other reason be sorted by BHS onto the correct flight lateral, they will be sorted into the late/problem bag area. The bags then need to be manually removed from the system by BHS operators, to await collection by RHOs.

12.7 The Airport Authority ("AA") contracted the design and build contract of BHS to a consortium consisting of SESL, Vanderlande Industries Hong Kong Ltd. ("Vanderlande"), Crisplant Limited ("Crisplant") and Siemens AG ("Siemens"). While BHS is operated and maintained by SESL, baggage handling is performed by the three RHOs, namely, Hong Kong Airport Services Limited ("HAS"), Jardine Air Terminal Services Limited ("JATS") and Ogden Aviation (Hong Kong) Limited ("Ogden").

12.8 BHS is an important system at the new airport. It affects flight departures and the time in which arriving passengers can collect their baggage. As the baggage handling chaos on airport opening day ("AOD") and the few days afterwards show, problems with BHS can have a huge ramification on the efficient operation of the new airport. The baggage handling problem will have a direct and significant impact on passengers, arriving or departing, causing delays and inconvenience to them. The problems with BHS and the actions taken to remedy the situation are dealt with in the following paragraphs.

12.9 There was a serious problem in the handling of baggage on AOD. According to AA statistics, some 10,000 of 20,000 departure and transfer bags missed their flights on AOD. W30 Mr Ben Reijers, Senior Design Engineer for BHS, testified that there might be around 6,000 instead of 10,000 problem bags. Some departure bags were loaded onto flights late, adding to delays in flights departing. Departure baggage handling started getting unmanageable by about 9 am on AOD.

12.10 On the first week of AOD, arrival passengers experienced significant delays in reclaiming their baggage. From Days Three to Seven, arrival passengers had to wait an average of one hour 41 minutes to collect their bags. There was also some confusion as to where bags were to be picked up.

12.11 The problems relating to baggage handling were serious in the first few days of airport opening. Passengers were inconvenienced and the standards previously achieved at Kai Tak were not met at the new airport until about the second week. The effect of the baggage handling problem was compounded by the other problems happening on that day, in particular, the problem with the Flight Information Display System ("FIDS"). Flights were delayed, there was confusion over stand and gate allocation and parking of planes. There were also problems in the allocation of reclaim carousels at BRH and in the display of the carousel numbers.

12.12 It is clear that the problems were caused by a number of separate and discrete matters, including human error. Some problems were the effect of other problems encountered in airport operations, eg, with the FIDS and the Trunk Mobile Radio ("TMR"). Each baggage handling problem had a significant impact, if not by itself, certainly when combined with the other problems encountered. The problems are classified as follows:

(a) accumulation of problem bags;

(b) system stoppages;

(c) delay and confusion in handling arrival baggage;

(d) stretching resources of RHOs; and

(e) inexperience or unfamiliarity of RHO, airline and SESL staff.

(a) <u>Accumulation of problem bags</u>

12.13 The main cause of the chaos for departure bags was the accumulation of a very large number of problem bags in the Baggage Hall which led to system die-back and stoppages. Many of the problem bags were not sorted and eventually missed their flights. On AOD approximately 30% of all bags went into the problem bag area as compared to 3% per day in normal circumstances at Kai Tak. About 5,000 problem bags remained at the end of AOD. Pictures showing the problem bag area with bags piling up are exhibited at **Appendix XIII** to this Report.

12.14 Bags are sorted into the problem bag area when departure bags miss their flights because the plane has departed or the laterals have been closed, when baggage labels cannot be read by either automatic or manual coding, or when for other reason they cannot be sorted by BHS into the correct flight lateral. The bags have to be removed from the system by hand and collected by RHOs.

12.15 On AOD, the problem bags had to be sorted manually between the three RHOs and further by each RHO according to their respective flights. RHOs' resources were thus stretched, and delays were experienced in transporting baggage to departing aircraft and in delivering baggage to arriving passengers waiting at the reclaim carousels at BRH on Level 5.

12.16 BHS was designed to deliver 1,400 problem bags per hour. This, to certain extent, depended on the capacity of RHOs in sorting the bags. According to W30 Reijers, it was expected that the staff would handle one problem bag per minute. However, on AOD, bags arrived at the problem bag area at a rate of around 10 to 15 per minute. This created difficulties to RHOs who had to remove the problem bags manually from the system. Bags not removed in time caused system die backs in the problem bag area and these die-backs together with other stoppages of the system led to more bags becoming late and problem bags. This vicious cycle led to the extreme inefficiency of operations in the Baggage Hall.

12.17 To relieve the problem bag area, at about 3 pm on AOD, SESL reset BHS parameters to divert problem bags to laterals instead of to the problem bag area. In order to achieve this, all infeeds had to be closed for about two hours and bags manually sorted by SESL staff.

12.18 The large number of problem bags was not caused by one single factor. Rather, a number of incidents happened on AOD led to this result. Some of the incidents are set out below. It should be noted that the incidents relating to system stoppages described later also contributed to the large number of problem bags. The particular problems are numbered to facilitate further reference in this Report.

12.19 *[BHS 1] Cathay Pacific Airways Limited ("Cathay Pacific") and Securair Limited ("Securair") staff fed about 220 bags from Kai Tak with no baggage labels into the conveyor system at the new airport.* There were about 815 pieces of interline baggage at Kai Tak, of which about 420 were brought to the new airport by Securair on AOD. These bags were not scheduled to depart on any flight from the new airport on AOD. Despite instructions from Mr Victor WONG Chu King, System Manager – Airport of Cathay Pacific to Securair's staff to use fallback tags or the OOG lift to deliver the bags to the Baggage Hall, Securair staff with the assistance of Cathay Pacific staff, put some 220 bags on the conveyor belt without tags. As these bags had no baggage labels, BHS identified them as problem bags and rightly diverted them to the problem bag area.

12.20 In the afternoon, Mr. Wong noticed his instructions had not been followed and stopped the use of the conveyor belt. The remaining 200 bags were then sent to the Baggage Hall by the OOG lift. The lift was also used on 8 July 1998 when a further 335 bags were delivered to the new airport. The remaining 40 pieces were taken to Securair's central tracing office.

12.21 *[BHS 2] Airlines checked in bags with incorrect labels or invalid or no BSMs.* Some departure and a large percentage of transfer bags bore labels with bar codes that were not recognisable by BHS, or were given BSMs of an incorrect format. W30 Reijers thought that about half of the problem transfer bags were the result of invalid labels. Japan Airlines Company Limited ("JAL") accepted that it introduced perhaps 600 bags with unrecognisable BSMs on AOD, because an old version of its computer programme had been mistakenly loaded in Tokyo. Thai Airways International Public Company Limited ("Thai Airways") admitted that seven of its transfer bags had labels that could not be read by BHS.

12.22 AA encouraged airlines to use labels that met International Air Transport Association ("IATA ") recommended specifications, which would satisfy baggage reconciliation security requirements as well as baggage identification requirements. However, adopting the specifications was a management issue for airlines who were under no obligation to do so. AA was aware that not all airlines would provide labels that met IATA standards. AA also foresaw that , some labels that met the standards might not be read by BHS. Accordingly, AA developed problem bag procedures to ensure a bag with a label that could not be read by the system would be routed to its proper destination. The drawback of this solution was that it put pressure on manual resources when the problem bag area was overloaded. This unfortunately materialised on the first day of operation of the system.

12.23 The inability of BHS to recognise BSMs was not always caused by airlines. In the case of Japan Asia Airways Company Limited, the wrong prefix (JL instead of the correct EG) was programmed for recognition by SAC in BHS for its bags. On AOD, all bags for this airline were diverted to the problem area as BHS was expecting BSMs labels for JL206 and bags with EG206 were unknown to the system. This problem was rectified within a few days after AOD. It is not clear from the evidence whether it was SESL or AA's Airport Operations Control Centre ("AOCC") who programmed the prefixes for recognition by SAC.

12.24 *[BHS 3] Airlines checked in about 2,000 bags with invalid flight numbers.* Some airlines entered flight numbers for baggage labels and BSMs that were different from those listed in the flight schedule, and were thus not recognisable by BHS. These bags were sent to the problem bag area. In one case, Flight CP8 of Canadian Airlines International Limited ("Canadian Airlines") was destined for Vancouver and Toronto. On the same flight, there were nine passengers who travelled from Hong Kong to Montreal via Vancouver with 21 pieces of baggage. Their baggage was tagged through to Montreal under a funnel flight number CP1088. BHS was unable to identify these bags which was sent to the problem bag area. Canadian Airlines admitted that it was responsible for the incident. It claimed that it was not aware that they should inform AA about the extra flight numbers on

BSM as AA did not consult the airlines about the use of extra flight numbers on BSM. No inconvenience was caused to passengers as the bags were picked up from the problem bag area and loaded on the same flight. Another case involved Ansett tagging bags with the originating Ansett flight instead of the connecting Virgin Atlantic Airways Limited ("Virgin") flight from Hong Kong.

12.25 *[BHS 4] Aviation Security Company Limited ("AVSECO") staff rejected a large number of bags at Level 2 security screening, putting pressure on Level 3 screening, lengthening baggage handling time and causing more problem bags.* It was alleged that AVSECO operators had rejected more bags at Level 2 security screening than in normal circumstances, probably being more cautious on the first day of operation, or did not decide within the set period of time whether to clear the bags or not. Many bags were thus automatically diverted to Level 3. Some of the non-conveyable bags had not been placed in tubs and were lost in tracking. These were also discharged to security screening on Level 3. AVSECO staff had difficulties in processing such a large number of bags, resulting in more problem bags. According to AVSECO, of 6,705 bags screened at [Level 3], 860 were bags rejected from Level 2, 1,713 were mis-tracked and 4,132 were diverted to Level 3 as a result of tubs not being used and the high number of emergency stops. The problem with emergency stops will be dealt with below.

12.26 *[BHS 5] RHOs delivered transfer bags from inbound flights into BHS after connecting flight laterals had been closed.* This was an example of the difficulties faced by RHOs as a result of the other problems faced by them on the apron. The lack of flight related information from FIDS and the inefficiency of means of communication meant that RHOs were delayed in meeting inbound flights and thus in delivering transfer bags to BHS. The frequent stoppages of the system, including intermittent stoppages of three out of four induction belts at the Central Transfer System, also contributed to the problem. Since the connecting flight laterals had been closed when the transfer bags were fed into BHS, those bags were diverted to the problem bag area. This problem would have occurred before 3 pm on AOD, as after that time departure flight laterals were kept open to allow circulation of problem bags.

12.27 *[BHS 6] RHOs did not clear bags from departure laterals in time, resulting in full lateral alarms, which caused subsequent bags to go to the problem bag area.* W30 Reijers thought that this created around 800 problem bags.

12.28 *[BHS 7] One of RHOs, Ogden, put about 230 arrival bags from a KLM flight No. 887 onto transfer laterals.* There were altogether about 260 bags from this flight, consisting of 30 transfer bags and 230 arrival bags. They were put onto the transfer laterals by Ogden. Whilst Ogden had rightly put the 30 transfer bags onto the transfer lateral, the 230 arrival bags should have been put onto the arrival laterals. These arrival bags were thus sorted by BHS into the problem bag area. Delay and inconvenience were caused to the arriving passengers on that flight. The bags were retrieved by Ogden and were placed on the appropriate reclaim belt. Most of the arriving passengers received their bags on the same day. W30 Reijers alleged that he saw Thai Airways and Aeroflot – Russian International Airlines incorrectly put arrival bags onto transfer laterals although this was denied by the airlines.

(b) <u>System stoppages</u>

12.29 There were some 500 stoppages of the system on AOD. One even lasted from late morning to mid-afternoon on AOD. Airline staff had to transfer bags from one conveyor belt to another. Stoppages in turn led to the accumulation of more late and problem baggage. The sorter system produced problem bags faster than it could discharge and the whole BHS started to die-back up to the infeed points Hence system stoppages and problem baggage caused a vicious cycle which eventually led to extreme delays in baggage handling.

12.30 Stoppages were caused or exacerbated by the actions or omissions set out below.

12.31 *[BHS 8] Bags that could not be safely conveyed were not put in tubs and OOG bags were fed into the conveyor system instead of being sent down to the Baggage Hall via the OOG lift.* At check-in counters, airline staff will label departure bags and place them on the conveyor belts to be sent to the Baggage Hall. Bags that cannot be safely conveyed, such as round or soft bags that will roll along the conveyors and rucksacks with straps that cannot be secured and so may become stuck in the system, should first be placed in plastic tubs to be conveyed on the system. Airline staff should take large bags to the OOG lifts to be transferred to the Baggage Hall, otherwise the conveyor belt would be jammed. These procedures were not new and airlines had been trained and reminded of them. There were about 200 to 250 bag jams on AOD caused by bags not being put in tubs and oversized bags being put on the conveyor. These jams caused system stoppages.

12.32 According to Mr Klaus Sterzel, Project Manager of Siemens and Mr Christopher James Bleasdale, Contract Director of SESL, at about 9 am on AOD, BHS started to die back because the secondary sorter infeeds were stopped too frequently due to incorrectly presented baggage. The offending bags were usually oversized or not placed in tubs when they should have been.

12.33 *[BHS 9] Too many erroneous emergency stops led to numerous disruption and system down time.* The emergency stop buttons were pressed some 99 times on AOD. Many of the stoppages may have been deliberate, as when bags had to be manually removed from the system by the staff of SESL, RHOs or AVSECO. In one instance, a SESL staff restarted the system without removing a non-conveyable bag that went underneath a tilt tray sorter because it was not put in a tub. This resulted in damage to part of the system and some system down time.

12.34 RHOs explained that the emergency stop buttons might have been pressed accidentally, due to the protruding design of the buttons. AA and SESL, in consultation with the Labour Department safety officers, subsequently installed a cover to prevent accidental activation of the button. Although the protruding design could have resulted in easy accidental activation, there were competing safety considerations for making buttons easily accessible in an emergency.

12.35 *[BHS 10] Communication difficulties between operators in the Baggage Hall due to TMR overload and unavailability of other* *means of communication resulted in longer times for the system to be reset each time it was stopped.* W30 Reijers claimed that this exacerbated the problems caused by system stoppages because operators had difficulties communicating with each other and resets of the system which could have taken one to two minutes had taken 10 minutes instead.

(c) Delays and confusion in handling arrival baggage

12.36 On AOD, delays and inconvenience were caused to arriving passengers who had to wait longer than usual before they could retrieve their bags. Arrival baggage is first brought by road vehicle from the aircraft to the conveyor loading stations located in the Baggage Hall. There, RHOs transfer the bags onto conveyors that take the bags to the reclaim carousels in the Arrivals Hall on Level 5. Passengers would proceed to the reclaim carousel assigned by the baggage handling operator ("BHO") from SESL in the Baggage Control Room ("BCR") and displayed on the FIDS monitors located after immigration clearance and in the Arrivals Hall, to pick up their bags. A number of problems arose in the above process, details of which are set out below.

12.37 *[BHS 11] RHOs had no reliable flight information from FIDS and had communication difficulties due to TMR and mobile phones overload and unavailability of other fixed lines of communication.* There were delays in collecting bags from aircraft and transferring them to the Baggage Hall. This was the result of the snowball effect of delays on the apron caused by a number of factors. Stand allocation by Apron Control Centre ("ACC") was delayed due to problems encountered with flight swapping early in the morning of AOD and with Terminal Management System ("TMS"). Stand allocation input into FIDS was delayed also by the slow response time of FIDS. At about noon, where the new airport experienced full apron, aircraft that had landed had to wait on the taxiway for the next available stand. There were problems disseminating flight information to RHOs, which increased ground time for handling arriving passengers and baggage. Flight information was not displayed via Flight Data Display System ("FDDS"). TMR was overloaded, creating difficulties in users obtaining a channel of communication and there were insufficient fixed lines of communications to enable RHOs to get in touch with ACC or AOCC to obtain stand information and arrival times. No joy could be found in the use of mobile phones whose networks also experienced overloading problem. Hence RHOs were hampered in their operations because they had difficulties knowing the time and at which stand the aircraft would park.

12.38 At about 4 pm on AOD, a meeting was held in the Airport Emergency Centre ("AEC") between AA, AOC, RHOs and BHO to discuss communication difficulties and an information centre was set up in the AEC after that meeting. After that, information on stand allocation was passed from ACC by phone, fax and TMR to AEC. Airline staff, RHOs and baggage handling staff had to go to the whiteboard at the AEC to look for the stand allocation and relay the information by telephone to their colleagues. With this arrangement in place but only at 7 pm, it was possible for operators to know the stand and times of arriving aircraft, but it increased the ground handling time of RHOs and was a drain on their resources.

12.39 *[BHS 12] RHOs did not use both feedlines of carousels.* An allegation was made against RHOs that they did not maximise the use of the feedlines of carousels as each arrival carousel could be fed by two conveyors, which increased despatch times. This led to the slowing down of the baggage handling process.

12.40 *[BHS 13] RHOs did not know the assigned lateral for arrival bags.* Reclaim laterals are usually assigned by SESL according to a pre-arranged allocation, which is distributed to RHOs and BHO on a template the preceding night. This is also the practice today. However, on AOD the template could not be relied on because of changes brought about by flight delays and changes to flight schedules. SESL could not properly rely on the schedule for actual allocation of laterals on AOD, because flight delays made it necessary to estimate the time after the actual time of arrival ("ATA") of a flight when its passengers would arrive at the reclaim carousels. Display parameters were extended to leave displays on for a longer time to wait for arriving passengers who might have been delayed in disembarkation.

12.41 From the point of view of RHOs, the pre-arranged lateral allocation schedules for arrival baggage were rendered useless at around 8 am on AOD. This was when SESL reallocated laterals in order to optimise their use. This was an attempt to reduce delays in despatching arrival baggage by reallocating laterals on a real time basis. The new lateral allocations were displayed for passengers inBRH. Unfortunately, RHOs did not receive the information, as the FIDS LCD boards in the Baggage Hall were not working. Thus baggage did not arrive at the announced reclaim belt for passengers. Furthermore, given the limited means of communication, it took longer for RHOs to receive the necessary information. In some cases, RHOs also had to run around to find out the location of the allocated lateral. This increased handling time for arrival bags.

12.42 One incident of bags not arriving at the announced reclaim lateral was reported to AOCC at around 8 am on AOD. The problem was apparently resolved when SESL was told by AA to revert to the original fixed schedule and stop real time reallocations at about 8 am.

12.43 *[BHS 14] RHOs abandoned unit load devices ("ULDs") around arrival baggage feedlines, causing congestion and confusion in the Baggage Hall.* Congestion and some confusion resulted in the Baggage Hall because RHOs left both full and empty ULDs around arrival baggage conveyors.

12.44 *[BHS 15] FIDS workstation in BCR performed slowly and hung frequently.* It had been suggested that there were "serious response problems" with FIDS allocating reclaim laterals on AOD. In AA's FIDS log, the FIDS workstation in BCR was recorded to have "hung up" at 10 am and frequently at other times or took a long time to execute functions. According to W26 Mrs Vivian CHEUNG Kar Fay, Terminal System Manager of AA, it took 20 to 25 minutes to make one reclaim belt allocation at times on Days One and Two. Therefore on AOD there was either no or delayed displays of reclaim belts to RHOs and to passengers. W35 Mr Gordon James Cumming, Sub-contract Manager of Electronic Data Systems Limited ("EDS"), the contractor for FIDS, and W26 Cheung gave evidence that at about 10 am the performance of the FIDS workstation in BCR was so slow that AA/EDS decided to reconfigure the parameters. At about the same time, the whole operation of reclaim belt allocation was taken over from SESL by AOCC. The workstations in AOCC had the same response problems, but operators in AOCC could switch from one workstation to another when the first one hung and was being rebooted.

12.45 *[BHS 16] There was no reliable flight information displayed on the LCD in the BRH.* LCD boards in the reclaim area did not display correct or any information as to where passengers should pick up their bags. This problem could have been caused by missing components in the board, cabling problems, slow performance of FIDS inhibiting data entry or failure of BHO to allocate flights to reclaims or to progress flights correctly. The result was that displays were cleared off too quickly or the provision of the relevant information was delayed. To fill in or supplement missing information, AA put whiteboards with necessary information written on them at BRH on Level 5 early in the morning on AOD.

(d) Stretching of RHOs' resources

12.46 *[BHS17]* While RHOs had considered problem scenarios in their preparation for AOD, for instance, losing sorters, losing power and being faced with a large number of problem bags, none of them were prepared for such a large number of problems bags that arose on AOD.

12.47 Additional drain on RHOs' resources was caused by the lack of essential flight information via FDDS or other means of communications. On AOD, because of the problem with lack of accurate flight information, runners had to go between AOCC's whiteboard and staff on passenger and cargo ramps to pass on information that should have been available from FDDS. The lack of flight related information from FIDS and FDDS was exacerbated by the failure of TMR and mobile phones due to overloading of the systems which was, in turn, caused by sharp increase in usage because of FIDS failure. This caused difficulties to RHOs as to where to send staff to pick up or to load baggage.

12.48 There was allegation against RHOs that on AOD they had inadequate manpower deployed at the problem baggage area to remove the large number of bags going there. The build up of problem bags meant that RHOs manpower was severely stretched with manually sorting these problem bags. A consequence of the stretched resources of RHOs was that the Remote or Hot Transfer System, although available, was not used to handle transfer baggage. As a result, all transfer baggage was handled only by the Central Transfer System in the Baggage Hall, which slowed down operations. *[BHS 18]* For instance, JATS decided not to use the Hot Transfer System in order to conserve its baggage handling resources for the main baggage handling area to assist with the clearing of problem bags.

12.49 To cope with the worse than anticipated situation on AOD and especially the number of problem bags, HAS engaged additional staff in the days following AOD to clear the backlog. For Odgen, 60 trained staff from associated companies in overseas operations were sent to the new airport to support operations in the first month of AOD. JATS also deployed extra staff and continued working extended hours to process the backlog. By about Day Three, the situation had improved significantly and baggage operation began to normalise.

(e) <u>Inexperience or unfamiliarity of airline, RHO and SESL Staff</u>

12.50 *[BHS 19] Many of the actions of airline, RHO and SESL staff demonstrate their inexperience or unfamiliarity with operations in a new environment and with a larger scale of operation, for example the airlines' incorrect method of introducing unconveyable bags into the system.* Staff of airlines and Securair showed an inability to deal correctly with new situations such as when they sent Kai Tak bags with no labels into BHS. Inexperience and unfamiliarity may also have caused operator and staff to be overwhelmed by the delays and confusion caused by a lack of flight information vital to their operations, as when a RHO put arrival bags into the transfer system, although the arrival and transfer belts were some 25 metres apart.

12.51 On the system itself, HAS argued that on AOD, only one of the four transfer belts was working properly. This created difficulties for HAS in handling transfer baggage. It is not clear from the evidence what caused the intermittent stoppage of the three laterals. It might have caused by the system stoppages and die backs referred to above. The intermittent nature of the stoppages of the system indicated that the system could function again quickly after a restart and did not require remedial measures to be taken on the system itself. Other than HAS' allegation, it does not appear from the evidence that there was any design fault or error with BHS. AA also maintained that at no stage that BHS ceased to operate otherwise than as designed. Other than some parameter settings, no change was made to the functionality of BHS since AOD. W55 Dr Ulrich Kipper, the Commission's expert, commented that BHS worked as designed without error. On the evidence, the Commissioners are of the view that the problems with baggage handling were probably not related to the system itself, but rather were the result of causes external to it.

Remedial Measures and the Present Status

12.52 During the days after AOD, there was improvement to the performance of FIDS, and the direct and consequential problems it created gradually subsided. On Day Two, the number of bags left over was 6,000 out of a total of 24,000 bags processed. This was reduced to 2,000 (out of 26,000 bags), 1,400 (out of 27,000 bags) and 220 (out of 27,000 bags) on Day Three, Day Four and Day Five respectively. RHOs were able to return to normal operation by about Day Three to Day Four. RHOs, passenger handling entities and airlines had worked with AA to put more logic into the assignment of gates to minimise the amount of RHOs' travelling time around ramps. Further, as staff and operators became more experienced and familiar with the system and operation, baggage handling at the new airport improved significantly.

12.53 AA's statistics showed that by Week 2 of AOD, the average figures for first and last bag delivery times were similar to figures for Kai Tak, and were improving. The latest statistics published by AA show that during 1 December 1998 to 3 January 1999, 90% of the flights, the first and last bag delivery times were 19 minutes and 36 minutes respectively, which far surpass the figures of 25 and 43 minutes for Kai Tak. In the week commencing 31 August 1998, only 296 bags out of a total of 228,000 departure and transfer bags processed missed their flight.

As at today, the baggage handling process can certainly be said to have attained the world-class standard.

Section 2 : Moderate Problems

12.54 Chapter 8 sets out briefly the problems which the Commissioners regard as moderate. This section of Chapter 12 deals with each of these problems in detail, outlining their causes and remedial measures. The responsibility for each of these moderate problems is reviewed in Chapter 15.

[26]Delay in Flight Arrival and Departure

12.55 There were significant delays of incoming and outgoing flights during the first week of operation of the new airport. The following table sets out statistics of the delay during the first week of AOD.

Incoming flights

	AOD	**7 July**	**8 July**	**9 July**	**10 July**	**11 July**	**12 July**
Number of flights	213	227	220	240	220	230	235
Early arrival and on time	51%*	32%	34%	46%	47%	38%	50%
Delay within15 minutes	7%	20%	21%	23%	27%	26%	28%
Delay within 30 minutes	23%	34%	35%	36%	41%	44%	37%
Delay within 60 minutes	36%	48%	53%	47%	49%	53%	45%
Delay more than 60 minutes	13%	20%	13%	7%	4%	9%	5%
Average Delay for Incoming Flights (Hour)	0.4 hr	0.8 hr	0.6 hr	0.6 hr	0.4 hr	0.6 hr	0.4 hr

* *Holding time of aircraft on the taxiway is not included*

<u>Outgoing flights</u>

	AOD	**7 July**	**8 July**	**9 July**	**10 July**	**11 July**	**12 July**
Number of flights	207	227	220	240	220	230	235
Delay within 15 minutes	0%	7%	6%	15%	16%	22%	13%
Delay within 30 minutes	3%	15%	25%	36%	41%	55%	47%
Delay within 60 minutes	13%	38%	66%	75%	77%	86%	81%
Delay more than 60 minutes	87%	62%	34%	25%	23%	14%	19%
Average Delay for all outgoing Flights (Hour)	2.63 hrs	1.7 hrs	0.9 hr	0.7 hr	0.8 hr	0.6 hr	0.7 hr

12.56 It is clear from the above tables that the greatest element of flight delay in the week from AOD was in respect of departing flights, with delays for more than 60 minutes ranging from 87% to 14%. For incoming flights, delays for more than 60 minutes ranged from 20% to 4%. Since 13 July 1998, the average delays for both incoming and outgoing flight were comparable to those for Kai Tak in July 1997. By end of the first month of operation, the average delays for incoming and outgoing flights at the new airport were less than the statistics on the same subject for Kai Tak.

12.57 On AOD, delays became more serious after around 11 am when traffic was very busy. W23 Mr Alan LAM Tai Chi, General Manager (Airfield Operations) of AA said the morning on AOD between 7 am and 9 am was not particularly busy as there were only 11 arrival flights. Traffic began to build up around 11 am and over lunch time.

12.58 The statistics for arriving flights on AOD show that on average aircraft were achieving "chocks-on" within 24 minutes. The "chocks-on" time will not equate with the time at which passengers were able to disembark. The combined effect of the various causes for the flight delays described below was that it took much longer than the usual turnaround time for an aircraft arriving at and departing from the new airport. This longer turnaround time comprised delays in disembarking passengers and unloading baggage and cargo from arriving aircraft and delays in embarking passengers and loading baggage and cargo onto departing aircraft.

12.59 Delays were also caused to some of the passengers by reason of the additional time taken to travel to and from aircraft parked at remote stands at the new airport. Under current operations, an average of 80% of arrival flights are handled at frontal stands leaving about 20% of flights being serviced at remote stands. On AOD, approximately 50 aircraft were serviced at remote bays representing 30% to 40% of the flights.

12.60 The main cause of the problem was the inefficiency of FIDS resulting in the lack of accurate flight information. The witnesses from all three RHOs said that FIDS was the major problem which affected their ability to render timely and efficient service to their customer airlines. Other causes contributing to the flight delay as well as the delay in the disembarkation of passengers included the baggage handling chaos, the Access Control System ("ACS") and Public Address System ("PA") malfunctioning, confusion over parking of planes, malfunctioning of airbridges, late arrival of tarmac buses and communication problems experienced by RHOs and the other operators at the new airport. The latter is caused by the problems with TMR and mobile phones due to overloading and poor quality of transmission. All the above problems are discussed separately in the rest of this chapter and in Chapters 9 and 15.

12.61 Another contributory factor to the flight delays on AOD was the disruption on the cargo apron. For instance, export cargoes were delayed in being prepared for collection by the RHOs for loading onto some aircraft and in some cases were not loaded onto the aircraft at all.

Furthermore, import cargo were not being processed quickly enough so that the normal procedure for cargo handover was not able to be adhered to. These had, to a certain extent, caused delays to incoming and outgoing flights. The cargo handling chaos is described in more detail in Chapter 11.

[27]<u>Malfunctioning of ACS</u>

12.62 ACS is one of the most crucial systems for airport security and its status could affect the aerodrome licence. ACS is a computerised system that performs three functions, namely, (1) production of permits to authorised holders to unlocked doors; (2) verification of permits to identify personnel that are entitled to enter certain restricted areas; and (3) monitoring movement of personnel through ACS doors and when doors are opened and closed. ACS doors will only open on the swiping of a valid swipe card with appropriate access rights. Sometimes, inputting of a personal identification number (“PIN”)is required. The ACS will then check the swipe card against information that had previously been input and stored in the system. There are some 5,000 doors in the new airport, of which ACS controls about 1,505 doors. There are two types of permits or badges at the new airport. Permanent permits are for employees in the new airport. They can be used to activate the various doors in certain areas of the new airport depending on the areas that the respective holders are permitted to enter. Temporary permits are for visitors, contractors and other persons on a non-permanent basis. They are merely encoded with the information specifying the areas that the holders are allowed to enter.

12.63 The ACS stores all card holder information in a computer centrally. The information is also downloaded to various local Distributed Access Controllers ("DACs"). Each DAC controls around 12 doors. These DACs operate to prevent a person from gaining access to an area which he is not permitted to enter.

12.64 The contractor for ACS was Guardforce Limited ("Guardforce”). Its scope of work included the design, supply, testing and commissioning of system software, the network sub-system and head end equipment, the supply and commissioning of the permit production equipment installed in the Maintenance Headquarters and the installation works on site, and testing and commissioning of door control and interface units. Controlled Electronic Management Systems Limited ("CEM") was the nominated subcontractor of Guardforce for ACS. The doors, electro magnetic locking and detection devices were provided by another contractor of AA, the British-Chinese-Japanese Joint Venture ("BCJ"). The receipt of permit applications, coordination of application for security vetting purposes, data entry into the ACS database, applicants' photo taking, permit production and issuance were carried out by AVSECO.

12.65 Due to the delay in the progress of work which will be described below, ACS had not been completed on AOD although AA claimed that it was operational. For instance, there had been substantial slippage to the site acceptance test ("SAT") which was supposed to be carried out in around December 1997. The SAT was only about 60% complete as at 30 November 1998 and was expected to be finished in December 1998. Since AOD, various problems relating to ACS had been reported. There were problems in securing the timely production of security permits. ACS doors including airbridge doors were not working resulting in the deactivation of all the airbridge doors for departing flights from 7 July 1998 until 19 July 1998 and security guards were posted to maintain security. There were also allegations of security risk by reason of the inoperative or incomplete state of ACS.

12.66 The allegations of security risk are dealt with under paragraph [28] Airside Security Risks below. Another matter about security risk was mentioned by Guardforce. This was in relation to the alleged lack of intrusion detection on the North Shore Airfield of the new airport, which is to the north of the second runway site. According to Guardforce, the installation work that it had completed for the North Shore Airfield, which included ducting and foundation works, had been destroyed by another contractor working in the area. Guardforce suggested therefore that there was a problem with the intrusion detection on the North Shore Airfield, in that AA would not know if there were people trespassing on that side of the new airport. AA denied this allegation and stressed that there was no security risk. According to AA, the work being undertaken by Guardforce related to a construction site outside the present operational boundary of the new airport. AA also claimed that there is a separate fence between the construction phase of the works and the operational part of the new airport and the fence was patrolled by AVSECO security staff under the enhanced security arrangements in place since 13 June 1998 and with knowledge and approval of Civil Aviation Department ("CAD").

12.67 Despite the allegation, there was no reported incident of trespassing on the North Shore Airfield. In view of the remedial action taken by AA and the evidence before the Commission, it appears to the Commissioners that there is no problem with security on that part of the new airport.

(a) <u>Delay in permit production</u>

12.68 There were some problems with producing security permits in a timely manner. This problem was raised in relation to other issues such as the "no tap water in toilet rooms" problem under item [15] in Chapter 9. Lack of security permits would disrupt staff and workers in carrying out their work. For instance, BCJ complained that no swipe cards had been issued to it to allow independent access around PTB, which inhibited their work.

12.69 AA attributed some delay in permit production to the applicants. According to a survey of AA's business partners, it was anticipated that about 2,500 temporary permits and 24,000 permanent permits would be needed (26,500 permits in total). By the end of June 1998, some 14,000 and 25,000 applications for temporary permits and permanent permits respectively had been received (totalling 39,000 permits). The applications were also late. AA introduced a day pass system to relieve the pressure on production of permits. This however created further work for the Permit Office as new application for day pass had to be made every day.

(b) <u>Problems with the airbridge doors</u>

12.70 On AOD, 11 out of 38 airbridge doors were not working. AA's evidence was that on the night before AOD, it was discovered that a number of doors would not open with the swipe card. The malfunctioned doors were disabled, and where a quick repair was not possible, guards were deployed to guard these areas. According to W44 Mr Chern Heed, Airport Management Director of AA, there were at least two incidents on AOD where passengers were unable to exit the airbridges into PTB. One of the incidents occurred when about 200 arriving passengers from flight CX 722 were trapped in the airbridge at stand W46 and were unable to gain access into PTB because of the failure of the ACS door. To gain access, it appeared that these passengers had the airbridge door released by breaking the emergency break glass.

12.71 AA decided to disconnect all airbridge doors for departing flights from ACS on 7 July 1998. ACS was disconnected during the period 7 July 1998 to 19 July 1998. Security guards were then posted.

12.72 There were five other incidents after AOD where passengers were unable to exit the airbridges into PTB. There was also an incident involving the transit passengers of China Airlines Limited ("CAL") getting to the Departures Hall (through an ACS door which was deactivated at the time) without security check. As a result, the China Airlines aircraft had to be recalled after take off for security check. This incident is discussed under item [28] Airside Security Risks below. AA alleged that two out of the five incidents after AOD were apparently due to airline staff not arriving at the airbridge in time to open the airbridge door with a swipe card. Guardforce on the other hand denied knowledge of any of the incidents of trapped passengers. It argued that had they been related to ACS, AA should have informed Guardforce about them. The five incidents are set out as follows:

(1) *14:45, Saturday 11 July 1998 CX501 at Boarding Gate No.27.* The time of rectification was not recorded. Passengers were released subsequently through Departures Level doors.

(2) *09:08, Saturday 19 July 1998 CX460 at Boarding Gate No.3.* Ground staff arrived within eight to ten minutes and opened the doors at Level 5 immediately. AA claimed that this incident was due to the late arrival of airline ground staff and not the failure of ACS.

(3) *20:29, Monday 20 July 1998 CX507 at Boarding Gate No.3.* When the passengers disembarked, the airbridge door was locked and no airline ground staff were present. AA, Guardforce and AVSECO staff however were present, testing the swipe card reader. AVSECO staff therefore activated the door and allowed passengers to leave the airbridge. AA alleged that this incident was not caused by any failure of ACS.

(4) *05:42, Wednesday 22 July 1998 CX829 at Boarding Gate No.2.* The AVSECO guards could not open the arrival door with the swipe card when the passengers arrived. At approximately 05:45, one of the passengers broke the emergency break glass and released the door. The door was then temporarily removed by maintenance staff at 09:45 before being repaired.

(5) *12:00, Thursday 23 July 1998 CX710 at Boarding Gate No.4.* Passengers were unable to exit through the airbridge on their arrival. The guard on the airbridge immediately opened the arrival door with a test card after obtaining instructions from the AVSECO manager.

12.73 AA claimed that the above incidents were all of a short duration with minimal delay and inconvenience to the passengers.

12.74 New Airport Projects Co-ordination Office (“NAPCO”) claimed that the failure of ACS precluded access of departure gates on AOD, necessitating numerous gate changes by AA. AA disagreed and alleged that wherever there were problems with airbridge doors, staff would have been sent to open them. W44 Heed also maintained that no gate change was necessary because of the ACS failure.

(c) ACS doors and other system problems

12.75 Whilst problems with the airbridge doors affected passengers, other ACS door problems would have an impact on airline staff and other people working at the airport. The fault report for ACS showed that there were 440 reported faults with the system between AOD and 31 August 1998. This figure presumably included both faults with the airbridge doors and other ACS doors. The AA's Help Desk summary also provided some figures of reported incidents, which showed that there were 178 incidents in four weeks from the airport opening (44 in the first week of AOD, 29 in the second week, 48 in the third week and 57 in the fourth week). W44 Heed thought that these incidents were likely to be related to tenants or staff working at the new airport rather than to passengers. W37 Mr Dominic Alexander Chartres Purvis, Manager (Customer Services) of Cathay Pacific pointed out that access was a problem for their staff in PTB in the first month after opening due to failure of swipe cards.

12.76 According to AA, the major outstanding problems with ACS as at AOD consisted of the locking up of workstation for permit production, the DACs sometimes did not receive all records when card data was loaded into them in bulk, server concentrator failure and possible communications problems with airfield DACs.

(d) Causes of the ACS problems

12.77 AA attributed the delay to the completion of the ACS before AOD to Guardforce and CEM. According to AA, factory acceptance tests ("FATs"), which were supposed to be carried out between June and September 1996, did not take place until July 1997. In October 1997, W43 Mr Douglas Edwin Oakervee, Project Director of AA and Mr Alastair Blois-Brooke, Senior Construction Engineer of AA and a Guardforce's representative visited CEM in Northern Ireland in order to expedite CEM's work. There were delays in the delivery of the software by CEM which arrived on 18 December 1997 instead of early December 1997. Model tests for the system, which were supposed to be completed by September 1996, were only commenced in February 1998 and had not been completed as at 30 November 1998 when W47 Mr Graham Morton, Project General Manager of Guardforce gave evidence. Guardforce argued that the delay to the model tests was caused by the unavailability of the General Building Management System and the Building Systems Integration ("BSI") System by AA. SATs were supposed to be done in about December 1997 to January 1998. The progress of SATs continued to slip from March to June 1998. Although some software for ACS was delivered in December 1997 and on 9 May 1998, the final release of the software was not delivered to site until 2 July 1998. W47 Morton confirmed that as at AOD, the commissioning of ACS, SATs and reliability tests (including the testing on the head end computers) had not been completed prior to AOD. SATs on ACS were re-started after AOD in late August or early September 1998. W47 Morton told the Commission that as at 30 November 1998, the SAT was about 60% complete. According to AA, SAT was anticipated to be finished in December 1998. Confidence trials will be carried out between January and March 1999.

12.78 It was obvious that ACS was not ready as at AOD, at least in the sense that the system as a whole was not tested, although W25 TSUI King Cheong, Project Manager – Electrical & Mechanical Works of AA testified that the system might have been functioning. W44 Heed also acknowledged that ACS was handed over to Airport Management Division ("AMD") before it had been accepted by the Project Division of AA ("PD").

12.79 AA alleged that the major outstanding problems on AOD were primarily caused by physical damage to the ACS doors, software problems with ACS and generally by a lack of resources by Guardforce or CEM to complete the works on time.

12.80 Guardforce accepted that there were problems with the ACS software and systems. There was queuing problem with the head end computers. Where there was too great a backlog of data, the system could not handle the backlog. There was also a stability problem with the head ends. There was another problem with the server concentrators, which took the DACs offline for one or two minutes or an hour.

12.81 From AA's evidence, 95% of the ACS doors had been installed by mid-June, with locks powered and tested. Over the following three weeks there was a marked increase in the number of people using PTB. Security arrangements were being tightened up and an increasing number of doors were locked and connected to ACS. A number of doors were subsequently forced open for shortcuts, causing difficulties in testing. According to Guardforce, there were around 900 doors in respect of which ACS equipment including card readers and break glass units had been damaged by third parties. AA and BCJ had taken various steps to prevent the vandalism including the employment of additional security staff to patrol PTB, and the issuing of warning letters to apprehend the culprits. According to W47 Morton, tenants of PTB were made aware of the heavy penalties imposed on those who broke the rules, including the prohibition against using unauthorised doors for access. AA also implemented the Interim Security Measures limiting access to and egress from PTB to specific control points with security guards on duty. W44 Oakervee also said that with 1,505 doors that they tried to secure and with about 7,500 to 8,000 workers at the new airport at the time, it was virtually impossible to catch the wrongdoers despite measures being taken.

12.82 According to W47 Morton, since June 1998, there were about 8,000 to 12,000 alarms a day. This caused problems in the communication between the DACs and the head end computers. It created difficulties in getting the field end computer stable enough to allow correct testing on the head end. Software problems were therefore not discovered.

(e) Other remedial measures

12.83 Some alarms were set off due to operational errors. It was said that operators selected "staff" rather than "passenger" mode so that the door alarm sounded when the door was held open for too long. To prevent this, AA gave a series of briefing to airline staff from 17 July 1998 to 20 July 1998.

12.84 All airbridge doors were tested on a daily basis by AVSECO as from 26 July 1998. A week's confidence trial was carried out during the first week of August 1998. The system was activated section by section from 21 July 1998 to 27 July 1998. No fixed guards are now assigned to particular airbridges, although various such area are still patrolled by guards. The physical works on the doors, about 150 in total, were awaiting repairs as at 27 November 1998.

12.85 Turning to the outstanding problems on AOD mentioned by AA, Guardforce had successfully downloaded more than 35,000 data of permit holders to every DAC by 15 July 1998. Nevertheless, the problem was not resolved until the end of September 1998. The rest of the other outstanding problems were rectified by September or October 1998. The head end computers became stable around mid-September or the beginning of October 1998. There were some problems with them as at 30 November 1998, but most software issues had been resolved. The Tuxedo 6.4 version was loaded on 31 October 1998 to resolve the queuing problem with the head end computers.

12.86 On the issue of permits, AVSECO had made arrangement to run the Permit Office for 24 hours. Additional printers were installed to speed up permit production. One-day escorted permits were introduced by AVSECO to relieve the backlog of permit application. AVSECO claimed that it was able to process the one-day permit and the three-day temporary permit within 15 minutes on the day of applications. On AOD, the Permit Office had issued 1,053 escorted permits to enable contractors to carry out urgent repair works within the restricted area.

[28] Airside Security Risks

12.87 Airside security is of utmost importance in the overall context of airport security. Failure to ensure airside security would jeopardise the safety of passengers and aircraft. This explains why the Commissioners classify the following four incidents posing airside security risks as moderate.

(a) Delayed entry of police motorcycles into restricted area

12.88 On 10 July 1998, a minor traffic accident inside PTB Baggage Hall resulted in two workers sustaining slight injuries. Two ambulance service vehicles were allowed immediate entry to the Enhanced Security Restricted Area ("ESRA") to attend to the injured. However there was a delay in allowing traffic police on motorcycles entry into the ESRA. Normally, permits are required for entry into the airside restricted area. However, section 22 of the Aviation Security Regulations provides for exemption from these requirements where disciplined and emergency service vehicles and personnel are responding to an emergency. AVSECO indicated that it has established procedures to deal with disciplined or emergency service personnel and vehicles responding to an emergency. In the event that siren and flashing lights of such vehicles are activated, the vehicles would be allowed immediate entry into ESRA. The two ambulance service vehicles which were given immediate access to ESRA had activated blue lights and sirens while the police motorcycles had not.

12.89 AVSECO stated that since this incident, and also from the experience gained since AOD, procedures for dealing with disciplined or emergency service personnel and vehicles responding to an emergency were fine tuned in conjunction with the Police and other emergency services operating in the airport. The revised procedures are said to have worked well so far.

(b) Transit passengers allowed to enter Departures Hall and board flight without security check

12.90 Upon arrival of CAL flight CI 651 on 25 July 1998 at boarding gate 23, the ground staff of CAL took some 90 transit passengers direct from the aircraft to the Departures Hall on Level 6 of PTB without proceeding through Level 5 for security screening at the designated Transfer Points. The transit passengers boarded the flight and the aircraft took off but was subsequently recalled by CAL. All these 90 transit passengers were re-screened before departing Hong Kong.

12.91 At the material time of the incident, ACS at boarding gate 23 did not function. Had ACS at the gate been operative, there would have been an effective barrier which prohibited the entry from the airbridge to Level 6. A security guard of AVSECO was stationed there to stop arriving passengers from going to the Departures Hall but did not do so.

12.92 Upon being notified by AOCC, the AVSECO Duty Manager responded to the scene, but after the CAL staff and the passengers had left. The AVSECO Duty Manager then contacted the CAL Duty Manager and asked him to undertake security screening for the passengers or else CAL had to accept the responsibility for the flight to proceed with the unscreened transit passengers on board.

12.93 When the CAL Duty Manager decided to conduct screening on the passengers, the flight had already departed. The AOCC therefore requested the Air Traffic Control ("ATC") to call back the aircraft. This was not acceded to as such a request should come from the airline concerned except in an emergency in which case it would come from designated police officers. CAL then contacted the aircraft via their company frequency. The pilot advised ATC of the decision to return to Hong Kong International Airport.

12.94 Subsequent to the incident, CAD conducted an investigation and found that CAL had breached airport security procedure. CAL apologised for the breach, and undertook to take steps to ensure that there was no repeat of the incident. AA sent a circular to all airport organisations reminding them of the need to adhere strictly to airport security procedures.

12.95 Separately, CAD has written to AA to offer a number of suggestions to improve security arrangements to prevent recurrence of the incident. Some of these suggestions have already been implemented, for example, tensa barriers have been set up in airbridges to demarcate more clearly the Arrivals and Departures channel within the airbridges. Other suggestions include putting up clear directional signs inside airbridges to direct passengers to appropriate ramps and warning signs prohibiting transit/transfer passengers from going up to Level 6 ramps. Passenger handling is carried out at separate transfer desks located within the body of PTB.

(c) Unauthorised access to Airport Restricted Area (ARA)

12.96 The Commissioner of Police established that between 6 July and 17 October 1998, a total of 55 cases of breach of ARA were reported to the Police. A large number of cases involved failing to possess a permit, failing to carry a permit which has been issued, and using a permit which belonged to another person. In the early days of operation of the airport, many people appeared to be confused about the permit requirements, and the conditions applying to the use of the permit. Some appeared to have tried to circumvent the regulations by using permits belonging to others with the intention of carrying out duties at the airport. By far, the majority of those intercepted were persons working, either permanently or temporarily, at the new airport. The greatest number of incidents occurred within the first month after AOD, but there was a marked decline in the number of incidents over subsequent months.

12.97 In his witness statement, Mr Sidney FC CHAU, General

Manager of AVSECO, explained to the Commission that the majority of the unauthorised entries were technical in nature devoid of any criminal intent. These unauthorised access cases were attributed to one or more of the following:-

(i) permit holders not being familiar with the new airport environment and physical setting of the different operational zones of the ARA at the early stages of airport operation. The size of the new airport, which is seven times that of Kai Tak, is also relevant;

(ii) sponsoring organisations not giving adequate instructions to their staff on the conditions of issue of the permit;

(iii) AA not providing sufficient signage during the initial stage of operation of the airport; and

(iv) less than effective control over unauthorised entry caused by operational problems arising from deployment of security guards whilst ACS was under test.

12.98 There was a marked decline in the number of incidents of unauthorised entry over subsequent months as a result of :-

(i) permit holders getting more familiar with the geographical layout and security arrangements at the new airport, and the conditions of issue attached to the permits;

(ii) more signage and warning notices being provided by AA;

(iii) round-the-clock guarding and patrol services being introduced and maintained by AVSECO to complement ACS; and

(iv) measures to strengthen ACS.

(d) <u>A KLM flight took off with baggage of two passengers who were not on board</u>

12.99 On 8 July 1998, a KLM flight KL888 departed for Amsterdam with the checked baggage of two passengers on board but without those passengers. Boarding of passengers commenced 35 minutes behind the flight's estimated time of departure. Boarding gate readers ("BGRs") were used to scan through boarding passes ("BPs"). It was discovered during the process that BGR was not working properly. KLM staff hence switched to manual collection and checking of BP stubs to verify the number of passengers boarded. The result indicated that 10 passengers were missing which appeared unlikely to the boarding staff as the flight was already 50 minutes behind schedule. The cabin crew then conducted a passenger head count. It was reported that the figure given by the cabin crew was equivalent to the final number of passengers checked in (ie, 218) after two round of counts. At this time the flight was nearly an hour behind schedule. On the understanding that the head count matched with the number of passengers checked in, , and that the missing BP stubs could have been due to failure to remove the stubs from the BP during the rush, the boarding staff formed the opinion that all passengers were on board. Since there was no report of any missing passenger, no request was made to the baggage handling staff for the removal of baggage.

12.100 Two passengers showed up at the boarding gate when all the doors had been closed and the aircraft was about to take off. It was not until then that the boarding staff realised that the head count was incorrect. The two passengers were arranged to depart via another airline.

12.101 Subsequent to the incident, KLM has taken measures to avoid a repeat. CAD has issued a letter to airlines to remind them of the need to ensure compliance with the requirements of the Hong Kong Aviation Security Programme ("HKASP").

[29]<u>Congestion of Vehicular Traffic and Passenger Traffic</u>

12.102 On AOD, there were traffic congestion, congestion at lifts from Level 3 (ground level) to the PTB and contra-flow movement among passengers on the down ramp from Arrivals on Level 5 to Level

3.

12.103 Members of the public who wish to travel to the new airport can take the following buses: Airbuses (‘A’ buses) which are aimed at taking air passengers to and from PTB; external buses (‘E’ buses) which are catered for carrying staff and workers to and from the main employment centres on Chek Lap Kok (“CLK”) Island; shuttle buses (‘S’ buses) which take passengers from the Tung Chung MTR station to PTB; there are also overnight routes providing services to the passenger during late evenings and early hours of the day. ‘A’ buses stop at the departure kerb at Level 8 where travellers can walk down to the Departures Hall on Level 7. ‘E’ buses and ‘S’ buses stop at Cheong Tat Road on Level 3 (ground level) outside PTB.

12.104 During the first week of AOD, more than 60,000 curiosity sightseers per day visited the new airport, many of them taking the ‘E’ buses and ‘S’ buses. Traffic congestion occurred at the section of Cheong Tat Road near PTB where passengers alighted and got on board of the ‘E’ and ‘S’ buses. The large number of visitors increased the frequency of buses travelling to and from the airport. It also took longer for buses to drop off passengers. The situation was aggravated by the suspension of one of the two bus stops (ie, 15a) at Cheong Tat Road and the non-completion of pavement work. Vehicles needed to queue up to pull in or out and this further slowed down the traffic flow at Cheong Tat Road.

12.105 Passengers who were described as “joy-riders” did not find much joy after alighting from the buses. From Cheong Tat Road, passengers would reach Level 3 (the ground level) of PTB. Passengers who wish to get into PTB can make use of the six passenger lifts and escalators in carpark 2 and Level 3. However, none of these facilities had been put into service on AOD. The only way passengers could get to PTB was via the two staff lifts, the down ramp leading to the Arrivals Hall on Level 5 and the two emergency staircases. While people packed into the staff lifts, this led to lift congestion. Measures were taken to divert the passengers without luggage and sightseers to use the down ramp. As the down ramp was originally designed for the arriving passengers leaving PTB, this led to the contra-flow movement among passengers. Departing passengers who managed to go to Level 5 either through the down ramp or emergency staircases were confused as to how to get to Departures Hall from the Arrivals Hall inside PTB due to insufficient signage because the signs were not designed for this purpose.

12.106 A meeting to remedy the problems was called by the Transport Department on 8 July 1998 and attended by Citybus Limited, Long Win Company Limited, New Lantau Bus Company (1973) Limited and AA. The following measures were implemented from 11 July 98: Reduced the number of buses via Cheong Tat Road by re-routing the outbound routes to go via the Ground Transportation Centre ("GTC") bus terminus instead and by diverting some inbound routes to go via departure kerb on Level 8. This ensured that there was no more than a manageable flow of bus services into Level 3. Further, the "S" buses and "E" buses were segregated to observe bus stops 15a and 16a respectively. These measures were effective in resolving the traffic congestion on Cheong Tat Road.

12.107 The bus layby at the section of Cheong Tat Road between carparks 1 and 2 were extended and the outstanding pavement work was completed. Bus Stop 15a was reinstated on 27 July 1998. Availability of lifts from Level 3 had increased since 12 July 1998 until early August 1998.

12.108 AA had deployed additional staff for traffic and crowd control purposes since AOD. Temporary signs and barriers were installed to direct arriving passengers.

12.109 With these remedial measures and the number of curiosity visitors steadily decreasing, the traffic and passenger congestion problem were resolved.

[30]<u>Insufficient Air-conditioning in PTB</u>

12.110 The Commissioners will deal with the issue in respect of (i) PTB, and (ii) the tenant areas. The air conditioning system in the PTB mainly consists of the following:

(1) seawater supply for cooling provided by a pump system ;
(2) chilled water supply (cooled by seawater) provided throughout PTB; and
(3) air-conditioning plant (cooled by chilled water) which provides cool air to the public areas.

12.111 The chilled water supply is provided by six chillers, which rely on seawater supplied from six seawater pumps. Only five chillers had been commissioned as at AOD. The chillers will shutdown or "trip" if there is insufficient seawater flow. Generally, three to four chillers are enough to supply air conditioning to PTB at the design temperature of 24 degrees Celsius. The Commissioners note that the setting at 24 degrees Celsius might be a bit high for the general puller in Hong Kong, especially during summer time.

12.112 The insufficiency of air-conditioning was due to the shutting down of the chillers as described below. However, some of the complaints by the public might have been due to the rather high setting of the design temperature.

12.113 Young's Engineering Company Limited ("Young's") is the contractor for seawater pumps whereas AEH Joint Venture ("AEH") is the contractor for the chillers and the air conditioning plant.

12.114 Since AOD, AA has reported 12 occasions of chillers shutdown, causing disruption to the supply of air-conditioning to the PTB. Each of the incidents is described below.

12.115 (1) *6 July 1998*. On 6 July 1998, one to three chillers shut down during various periods for approximately four hours causing the temperature in PTB to rise by about 2 to 3 degrees Celsius. Three chillers (Nos. 3, 4 and 5) were operating, supported by two seawater pumps (Nos. 4 and 6) running at high speed. The following events occurred and is depicted in a diagram prepared by W54 Professor Xiren CAO, one of the Commission's experts at **Appendix VIII** to this report.

Time **Event**

10:15 am	Chiller No. 5 tripped due to a faulty low pressure switch protection device installed by Carrier. As a result, the control system, which Young's controlled, switched from two high speed seawater pumps to two low speed seawater pumps (Nos. 1 and 2) because of the reduction in demand of the seawater.
10:24 am	Pump No. 2 tripped due to a flow switch fault, leaving only one low speed pump running (Pump No. 1). As a result, Chiller No. 4 tripped due to insufficient seawater flow. This left only Chiller No. 3 running, supported only by Pump No. 1.
11:01 am	After unsuccessful attempts to contact the pump house operated by Young's through mobile phone or land line telephone, AEH tried to restart Chiller No. 4.
	Upon AEH's attempt to restart Chiller No. 4, the control system attempted but failed to restart Pump No. 2, which had a flow switch fault. Essentially, the bypass valves had opened causing reduced seawater flow to Chiller No. 3, which had to be shut down manually.
11:15 am	Young's reset the time delay for Pump No. 2
11:24 am	AEH restarted Chiller No. 4 again. The control system restarted Pump No. 2, and it tripped again after the preset time delay, indicating a fault in the flow switch.
	Young's therefore set Pump No. 2 into manual mode. The control system started another low speed pump (No. 3) successfully. At this point, the system without Pump No. 2 ran in auto mode.

1:10 pm	Chiller No. 3 was started
1:47 pm	Chiller No. 4 was started
2:36 pm	Chiller No. 4 having been stablised, Chiller No. 1 was started making a total of three chillers which were sufficient to support the air-conditioning supply to PTB.

12.116 From the evidence provided to the Commission and according to W54 Cao, the technical causes of the air conditioning problem on 6 July 1998 were as follows:

(1) A low refrigerant pressure switch fault caused Chiller No. 5 to trip at 10:15 am.

(2) A flow switch fault caused Pump No. 2 to trip. The flow switch on Pump No. 2 was removed and checked for possible debris that might have caused the flow switch to "stick".

(3) Inadequate communication between the bypass controller and pump house control systems which caused the bypass valves working undesirably, leading to reduced seawater flow to Chiller No. 3.

(4) A problem in the logic in the control system which tried to restart a faulty pump. The system might have preferred to start Pump No. 2 as it had the lowest run time. Changes have since been made by Young's to the logic that compares image run times.

(5) The delay in the start-up of the chillers was caused by communication difficulties between the chiller plant and the seawater pump house. AEH had attempted but failed to reach the pump house control room by mobile phone and by land telephone line. The latter method failed due to fire

alarm tests being conducted on AOD.

12.117 (2*) 10 July 1998.* On 10 July 1998, three chillers were operating, supported by three seawater pumps running at high speed. At approximately 9:15 am, one seawater pump tripped causing one chiller to shutdown due to insufficient seawater flow. The tripping of the seawater pump was caused by human error and the chiller was restarted within 30 minutes.

12.118 (3) *12 July 1998.* On 12 July 1998, four chillers were operating with four seawater pumps running at high speed. At approximately 10 am, due to a sudden energisation of a main chilled water branch, the pressure of the chilled water system was reduced, causing two chillers to shutdown. Air-conditioning service was affected due to the shutting down of two of the four chillers. All four chillers were back in operation within approximately two and a half hours of the incident. After the incident, AEH was asked to ensure that all energisation of chilled water pipe work was to be carried out by opening valves slowly to minimise system pressure fluctuations.

12.119 (4) *13 July 1998.* On 13 July 1998, four chillers were operating and four seawater pumps were running at high speed. At approximately 00:35am, all chillers and secondary chilled water pumps were shutdown due to voltage fluctuations affecting electrical supply to the chiller controls. These voltage fluctuations were allegedly caused by lightning strike. Young's alleged that although the lightning strike took place at 10:30 pm on 12 July 1998, its engineers did not receive a call until 4:30 am on 13 July 1998 about the interruption.

12.120 AA alleged that although the chillers had tripped and the demand for seawater ceased, the seawater pumps continued to operate. This was due to a software programme error with the control logic of the seawater pumps within the seawater pump house. Young's rectified the programming error by approximately 5:30 am on the same day. Seawater supply from the seawater pump house was not restored until approximately 6 am and chiller re-starting commenced at around 6:30 am. Three chillers were back in operation by approximately 7:30 am and the fourth by 9:15 am.

12.121 To avoid future fluctuations or losses in the power supply, "uninterruptable power supply" ("UPS") units had been installed between 28 September 1998 and 27 October 1998 to the chiller control panels and the panel serving the seawater controls in the chiller plant rooms.

12.122 (5) *28 August 1998.* At approximately 3:30 pm on 28 August 1998, all chillers tripped due to lightning strike affecting power supply to the seawater pump house. The pumps were subsequently re-started and the first chiller resumed operation within 45 minutes. The remaining chillers resumed within two and a half hours.

12.123 (6) *29 August 1998*. At approximately 1:40 pm (approximately 12:20 pm according to AEH) on 29 August 1998, all chillers tripped due to loss of seawater supply. Young's alleged that there was a loss in all external power supply to the pump house. AA alleged that the electrical protection setting to the banscreen motors in the seawater pump house had been incorrectly set and that Young's immediately altered the settings to rectify the problem. The first chiller resumed within one hour 20 minutes and the remaining within three hours 20 minutes.

12.124 (7) *30 August 1998*. At approximately 10:30 pm on 30 August 1998, all chillers tripped due to lightning strike affecting power supply to the seawater pump house. The pumps were re-started and the first chiller resumed operation within 45 minutes. The remaining chillers resumed within two hours 45 minutes. AEH alleged that the last chiller did not start until approximately 8:45 am on 31 August 1998 – ie, a disruption of approximately 10 hours. This was the third time air-conditioning supply was affected by lightning strike. After the UPS units had been installed between 28 September 1998 and 27 October 1998 to regulate power distortions from a number of possible causes, including lightning strikes, there have been no further reported incidents of interruption in air-conditioning supply due to lightning strike.

12.125 (8) *8 September 1998***.** At approximately 2:29 pm on 8

September 1998, all chillers tripped (AEH alleged that only two chillers tripped) due to a power failure caused by the tripping of circuit breakers on Young's switchboard. The power was immediately restored by Young's and all chillers resumed within one hour.

12.126 (9) *14 September 1998.* At approximately 7:00 pm on 14 September 1998, all chillers tripped due to human error whilst the contractor for the Mechanical Building Management System carried out testing of that system. All chillers were resumed within four hours. Signs have been posted on panels to warn staff not to turn off power supply.

12.127 (10) *12 October 1998.* At approximately 3:25 pm on 12 October 1998, air handling units and all chillers (only three chillers according to AEH) tripped due to a disturbance by the power system of China Light & Power Company Limited ("CLP"). CLP alleged that the incident was caused by third party damage to their underground cable which is a frequent cause of disruption to utility networks. All chillers resumed in over two hours (AEH alleged that there was an interruption of over four and a half hours).

12.128 (11) *22 October 1998.* At approximately 1:10 am on 22 October 1998, there was a planned shutdown of the chillers in order to test an interface with the seawater pump house. Control circuit modifications were made to Young's High Voltage motor control centre ("MCC") serving the PTB pumps in order to provide greater flexibility in the control sequencing of pumps. All chillers resumed within one hour (AEH alleged that there was an interruption of over two hours).

12.129 (12) *28 November 1998.* At approximately 11:30 am on 28 November 1998, all chillers tripped due to a loss in seawater supply. Young's alleged that this was in turn caused by an unauthorised isolation of power supply to the high voltage battery charger and associated UPS. AA alleged that the UPS unit was incorrectly set to bypass mode which prevented power backup. All chillers resumed within one hour 10 minutes (over two hours according to AEH). The UPS unit has been set to standby mode to provide power backup in the event of re-occurrence.

12.130 The air conditioning system of the tenant areas functions similarly to the one in PTB as described in para 12.110 with the exception that each tenant supplied and fitted its own air conditioning plant which was then connected to AA's chilled water system. The tenant's air conditioning plant provides cool air to its own individual areas.

12.131 Before connection to AA's chilled water supply, the tenant was required to have, amongst other things, completed the tenancy pipe work installation and submitted to AA a request for chilled water energistion. Upon receipt of the request, AEH was to energise the chilled water within three days.

12.132 There were delays experienced in the energisation of tenants' chilled water supply, causing insufficient air conditioning being supplied to the tenanted areas of the PTB. The delays were mainly caused by the large quantity of late requests from tenants for connection to AA's chilled water supply which were in turn caused by the failure to complete or commission the tenants' installation of its air conditioning system by the tenants' contractors. As a result, AEH was faced with a huge volume of requests in the period immediately before AOD. Other contributing factors included crossed pipe work in the North and South Concourse, difficulties of gaining access outside tenant working hours and restricted access to PTB necessitated by the opening of the airport.

12.133 With increased working hours and labour from both AA and AEH staff, all requests for chilled water by tenants were processed by 13 July 1998.

[31]<u>PA Malfunctioning</u>

12.134 Public announcements at the new airport can be made centrally or at local gates. When the calls are made centrally, the person who makes the announcement can select the message to be broadcast to all or selected areas. Requests for boarding, calls for passengers and the like are announced locally at the gates. Gate changes are announced centrally.

12.135 The public address system operating within PTB is the General Coverage Public Address ("GCPA") which will be referred to as the "Central PA". Apart from the Central PA, there are consoles just off the loading bridges at each of the gates mainly controlled by airline operators and AA staff. They are collectively referred to here as the "Local PA". Hepburn Systems Limited ("Hepburn") is the main contractor for the PA while SigNET (AC) Limited ("SigNET") is its sub-contractor.

12.136 Throughout PTB, there are 22 communication rooms which service particular geographic areas of the building. The link between AOCC (from where announcements are made) and the communication room is via the BSI system and the Voice Routing System ("VRS"). As the BSI and VRS systems were not available on AOD and for some time thereafter, announcements were made through the use of the manual all zone ("MAZ") system.

12.137 The MAZ system operates through a notebook computer in AOCC. Through the use of this system, the operator can identify the geographical area of the airport in which an announcement is to be made. The MAZ system is connected to one of the communication rooms and information travels from one communication room to another.

12.138 On AOD, the Central PA was down twice for a total of an hour as alleged by Hepburn, or 46 minutes as alleged by AA. On 7 July 1998, the Central PA was down for six times totaling three hours and 37 minutes. One particular downtime lasted two hours and five minutes. On 8 July 1998, five occurrences of downtime were experienced, totaling two hours and 46 minutes. The Central PA was also reported to be unserviceable for a few minutes up to one hour five minutes on 10, 14 and 19 July and 16 August 1998.

12.139 There were many instances of failure of the Local PAs. AA and Hepburn had different records of the number of problems. According to AA, 26 gate consoles experienced problems in the first week of AOD, 21 reports of PA problem in the second week, 25 in the third week and 122 in the fourth week. These were significant numbers of failure considering that there were only about 50 consoles. The new airport still experienced two system failures a day for the Local PA as at late November 1998. Initially, Hepburn asserted that only about four consoles were not operational on AOD. Hepburn later agreed that a total of 12 consoles were not working. According to Cathay Pacific, announcements for three of its flights on 6 July 1998 and one of its flights on 7 July 1998 were not made.

12.140 Problems affecting the PA were ongoing and variable in nature, including both hardware and software problems. Hardware problems include

(a) incomplete installation,
(b) human-induced damage to membranes to the consoles and gooseneck microphones, and
(c) defective consoles due to failure of electrical components.

Software problem comprise

(d) intelligibility,
(e) zoning and priority problems,
(f) slow response time,
(g) overriding,
(h) system instability, and
(i) locking and latching to downright console outages.

(a) <u>Incomplete installation of equipment</u>

12.141 There were four areas in which items of equipment had not been installed prior to AOD. These are (a) speakers at lift lobbies in the central concourse on Level 6; (b) speakers at the east hall corridor; (c) two of the baggage reclaim microphone consoles; and (d) some equipment in areas within the GTC. Hepburn alleged that AA should be responsible for the incomplete installation. Hepburn alleged that items (a) and (b) were not installed because the false ceilings had not been installed. Item (c) had not been installed because the necessary increased conduit was not available as at AOD and it was not physically possible to install the equipment without the conduits. As for item (d), access to the GTC was not provided until the end of May 1998, some 18 months later than the original date, so Hepburn did not have sufficient time for its installation. Nevertheless, this was not a widespread problem and it was specific to certain areas.

12.142 The ambient noise-operated amplifier facility (which sets the volume of PA announcement in accordance with the levels of ambient noise) was not installed prior to AOD although AA alleged that this did not prevent the operation of PA.

(b) Human-induced damage

12.143 Gooseneck microphones on a number of the consoles were damaged as a result of the microphones being bent or knocked prior to AOD, sometimes short circuiting the electronics below. Membranes covering the consoles on many of the consoles had been scored, apparently by coming into contact with pen or other sharp instruments. However the damage alone did not render the consoles inoperational. The precise causes of these damages are yet to be found. To rectify the damage to the membranes to the consoles and gooseneck microphones, AA and Hepburn went round all the consoles, double checked them and assisted airline on the actual usage of the system. Such measures, according to Hepburn, were successful.

(c) Failure of electrical components

12.144 Some of the failure of the consoles were caused by the failure of particular electronic components within the consoles. Hepburn alleged that the failure of particular electronic components within the consoles was usual after they were subject to full use. These consoles could not immediately be repaired as Hepburn had used up its stock of the particular spare part controllers required for these consoles.

12.145 According to Hepburn, the majority of the hardware problems were rectified within a week although it took slightly longer to replace membranes on the consoles. Repair and replacement of the defective hardware was largely completed by the end of September 1998.

(d) Intelligibility

12.146 On some occasions, users would notice that the announcement from the local PA was unclear or no announcement could be made by it. AA claimed that it was not aware of any report of lack of intelligibility on or after AOD although some reports were received during airport trials. AA however admitted that some echoing and volume problems were experienced on AOD in some parts of PTB.

12.147 Final adjustment to feedback and volume could not be made until the Rapid Assessment of Speech Transmission Index ("RASTI") testing was completed. The purpose of RASTI test was to assess the rapid speech intelligibility index of the actual sound of PA. The RASTI testing was dependent on the final configuration of PTB, including the complete installation of all acoustic related materials, the final fit out of tenant areas and shops, and any other material that might affect the acoustic performance of PTB. Prior to AOD, AA agreed with the contractor that such testing could only realistically be carried out after AOD. SATs, including the RASTI testing, were completed at the end of October 1998. Despite outstanding tests to be done, AA maintained that PA was functional on AOD.

(e) Zoning and priority problems

12.148 NAPCO pointed out that the PA design is such that when an announcement is made to a selected zone(s), the immediately adjacent zones are inhibited from making announcements. This will prevent conflict and lack of intelligibility due to overlapping announcements. NAPCO alleged that this was not set up or functioning properly as at AOD thereby causing zoning problems.

12.149 NAPCO also alleged that there were priority problems within the structure of PA. There is a priority level for different inputs into the PA. For instance a fire or bomb alert would be rated with a high priority and instantly take control of all selected zones. Airlines complained that announcements of a low priority from AOCC might block out more important messages which airlines and AA staff tried to announce at the gates.

12.150 The priority problem was overcome by resetting the system to allow everyone to have equal priority.

(f) Slow response time

12.151 For the airline staff to operate the consoles it is necessary for the staff member to input a 4-digit PIN. When the correct PIN is entered, a light on the console will indicate that it is operational. On AOD, Hepburn admitted that there was a relatively slow response time for this logging on process for some gates, including four gates identified on 11 July 1998. This created an impression on the airline staff that the console was not working. The slow response time in the logging on process was rectified by Hepburn in early September 1998.

(g) Overriding

12.152 On 13 July 1998, 29 local consoles were not serviceable. Of these 29, 20 gates were not operational because the MAZ system overrode the loading gate console. Hepburn corrected the problem within 30 minutes and claimed that it related to an isolated incident occurring on that date.

(h) Instability of the Central PA

12.153 On AOD, the MAZ notebook was not operational on two occasions in the morning and in the afternoon for about 29 and 17 minutes respectively. Subsequently, the same problem occurred on three or four further occasions after AOD rendering the PA inoperational. According to Hepburn, the power supply contractor, AEH, was notified of the problem. MAZ console outage was rectified within 15-30 minutes by resetting the MAZ notebook.

12.154 MAZ notebook outage, as alleged by Hepburn, was caused by the "noisy" earth lines between the communication rooms and were interfering with the data communication between the control room and the MAZ notebook. W47 Morton of Hepburn agreed, however, that he had no documentary evidence to support the claim of electrical interference and that the possibility of a noisy earth link was more like a deduction than an actual finding. Nevertheless, to remove the possibility of the noisy earth link, technical staff of Hepburn added isolators to PA at either end of the relevant cable to remove the earth link and allow the system to float independent of the earth.

12.155 AA denied that the instability of the MAZ console was due to a "noisy" earth line. AA claimed in its submission to the Commission that the cause of the instability in the MAZ console was unknown to it, and the problem disappeared about two weeks after AOD.

(i) Locking up or latching problem

12.156 Incidents of "lock out" problem caused by fire evacuation warning announcement were reported by AA on 10, 24 and 25 July 1998. When the fire alarm was triggered, it could not be turned off unless the system was manually reset after locking up, thereby affecting other announcements in the area concerned.

12.157 No actual fire report was recorded. The fire alarms were probably triggered by people breaking glasses in order to go through the ACS doors. The problem with the fire announcement was resolved by a software patch delivered by Hepburn in early September 1998.

12.158 Apart from the hardware and software problems described above, some problems with the PA were caused by human errors. On one occasion, AA's engineer forgot to replug the MAZ console back into its socket after testing, resulting in an inoperative console. Hepburn admitted that on another occasion, it was Hepburn's engineer who did the same thing. According to Cathay Pacific, some announcements requested were not made. That might have been because of system failures, or it might, as pointed out by Cathay Pacific, have been because either the phone lines were busy or AA staff simply did not make the announcements.

12.159 The problems with PA are classified as moderate by the Commissioners because of its terminal-wide use in the new airport and that a great number of passengers in PTB would have been affected.

They also featured significantly in the inquiry because PA was touted as one of the back-ups and workarounds for the dissemination of flight information in the absence of an effective FIDS.

12.160 Although the local gate PA had not been a reliable system since AOD, the overall impact of the deficiency of the Local PA should, as submitted by AA, be seen in the light of the following matters agreed by W51 Mr Jason G YUEN, expert for the Commission during his cross-examination: (1) in Hong Kong it is not common airline practice to board by rows, so the local consoles would not generally have been used for that activity on and immediately after AOD; (2) getting passengers to the gate is not a question of local PAs at all, but is a function of FIDS; (3) the local gate problem in isolation is not a significant problem. On the other hand, W51Yuen stated that the Local PA is essential in that it is used to announce boarding readiness, flight delays, and to page passengers. He also maintained that boarding instructions at gate rooms are basic requirements for airport operations. From an airport and airlines operational point of view, any problem with such a system should not be allowed to continue for over a month.

12.161 Further, if the Local PA fails, the message can be broadcast through the Central PA. The Central PA is only comparatively more stable than the Local PA. If the Central PA fails, there is very little the airport staff can do other than putting up whiteboards. If the message is urgent, people have to be sent to spread the message. The Commissioners note that the last contingency might create a strain on the airport resources and it would affect the image of the new airport as a world-class airport.

12.162 W44 Heed of AA disagreed that there would have been utter chaos for the passengers during the periods of PA outage on AOD, despite their occurrence at peak periods, because whether there would be chaos depended on the number of changes required to be announced through PA at that time.

12.163 According to AA, no passengers missed their flights as a result of the problems with local announcements, as gate changes were announced centrally from AOCC. No evidence has been received by the Commission as to whether any passengers missed their flights as a result of gate changes not being announced during the downtime of the Central PA.

12.164 Progress on PA fixes was monitored initially on a twice-daily basis and later on a daily basis in Task Force Meetings. AA held daily meetings with the contractor to track progress. A meeting was held 10 days after AOD to develop a programme for completion of outstanding work. Hepburn provided staff 24 hours per day during the first week of operation. Since AOD, Hepburn concentrated on resolving system integration and reliability including software problems, upgrading the Local PA at gate airline counters, level adjustments, zoning issues and hardware problems. It claimed that the majority of the problems were rectified within a week, although it took slightly longer for the replacement of the membranes on the consoles.

12.165 AA stated that SAT for PA commenced on 4 May 1998 and the agreement to defer the RASTI testing until after AOD would not have interfered with the other tests of PA. Hepburn admitted that they had problem with a Hong Kong sub-contractor, Univision Engineering Limited, and Hepburn had to change the sub-contractor. This affected the development of an interface software to the BSI, resulting in a delay in FAT. FAT was not completed until around the end of June 1998. SATs, including RASTI, eventually continued on 1 September 1998 and were completed at the end of October 1998. Those were apart from the testing for the maintenance reporting terminal which Hepburn expected to complete by the end of November. Hepburn also expected that confidence trials for the Central and Local PAs would be completed by about March 1999.

12.166 AA maintained that the MAZ console was not stable, until about two weeks after AOD. Problems with PA still exist although the system is more stable with fewer faults and failures.

[32] <u>Insufficient Staff Canteens</u>

12.167 Human resources play an important part, alongside with the various systems, in the operation of an airport. To enable efficient passenger services and air cargo operations, it is necessary to provide a reasonably comfortable working environment for staff working in the new airport including adequate and convenient catering facilities for staff. This would be particularly relevant for the new airport at CLK given that it is built on an island. The Commissioners have heard criticisms that staff canteens in PTB were substantially under-provided during the initial period of airport opening. The alleged problem of lack of sufficient staff canteens in the new airport has inevitably caused inconvenience to the staff working there.

12.168 JATS made specific allegations about the lack of catering facilities for staff and, on some occasions, staff had to wait for more than 40 minutes for a table and food. During the first two weeks, there was only one staff canteen in operation in PTB with a seating capacity of 250. Although there was an alternative for the staff to use the commercial catering facilities in PTB, these facilities were often very crowded, and were quite far away from their place of work, apart from being expensive.

12.169 AA explained that there are at present four staff canteens in PTB, two on the landside and two on the airside. Altogether, they can accommodate a total of 954 people at any one time. A breakdown of these facilities showing their seating capacity and dates of commencement of business is as follows:

Staff Canteen	**Location**	**Seating Capacity**	**Date of Opening**
Sky Bird 1	Baggage Hall, Level 2, Airside	250	14/6/98
Sky Bird 2	West Hall, Level 5, Airside	422	14/7/98
Sky Bird 3	Level 6, Landside	122	29/7/98
Sky Bird 5	Level 6, Landside	160	15/10/98
	Total :	954	

12.170 According to the Strategic Planning Department of AA, the number of staff working at CLK is about 44,629 on any one day. However, this is a figure showing all the staff working on the entire CLK island. The estimate given by the Department in May 1996 suggests that on any given day, there would be only about 14,600 people actually working in PTB in 1998. As at the end of March 1998, there were 26,788 people working at Kai Tak on any given day. There was only one staff canteen at the passenger terminal building at Kai Tak, capable of catering for a total of around 560 people. Based on these figures, it may appear that staff catering facilities at CLK compares favourably to that at Kai Tak. Moreover, in addition to the four staff canteens, there are other commercial catering outlets (both restaurants or kiosk style outlets) within PTB providing special discounts for airport staff. All of the landside commercial restaurants were contractually required to provide a staff meal programme to airport staff as a supplement to the staff canteen facilities. The total seating capacity of these restaurants is about 2,800. There are also a number of additional staff canteens provided by AA elsewhere in CLK and its various franchisees such as Hong Kong Air Cargo Terminals Limited ("HACTL"), HAS, Hong Kong Aircraft Engineering Company Limited ("HAECO") for their own staff. Judging from the above, there does not seem to be an obvious case for insufficient staff canteens.

12.171 The Commissioners, however, note that there are two more dimensions to the issue. First, it is not appropriate to compare the situation at CLK with that in Kai Tak because there were a lot of catering outlets in Kowloon City where the Kai Tak airport was situated. These facilities were easily accessible to airport staff working at Kai Tak. The new airport at CLK does not enjoy this advantage. During his oral evidence before the Commission, W44 Heed agreed to this point. Secondly, it is obvious from the table above that not all of the four staff canteens were available to provide service on AOD. From AOD right up to 13 July 1998, there was only one staff canteen in operation and two others were not opened until later that month. The remaining canteen only came into operation on 15 October 1998. The situation on AOD and the few days immediately after was aggravated by the presence of an overwhelming number of local visitors who came to the new airport for sightseeing. In her witness statement, Ms Eva TSANG Wai Yi, Manager – Retail Planning & Development of AA, quoted about 60,000 casual visitors on a single day in the week following AOD. This was in addition to the number of airport users. Their presence put pressure on the commercial catering outlets in PTB and substantially restricted the use of these facilities by airport staff. In fact, there were only nine commercial catering outlets offering food to airport staff at discounts on AOD although more outlets joined the discount programme at a later stage.

12.172 PD of AA was responsible for making available the mechanical and electrical services which were required for the operation of canteens and the availability of these services would dictate the size, capacity and location of the facilities. Both AA's AMD and Commercial Division were also involved in the planning of staff catering requirements. The requirements had also been discussed with the Airline Operators Committee. In the course of evidence, W43 Oakervee revealed that the original conceptual design was to build a main staff canteen within the maintenance building alongside PTB and that would be the biggest one for staff. However, for various reasons, including cost and profitability, the proposal was eventually rejected. There appears to be a lack of consensus between PD and AMD as to what were the reasonable planning requirements for staff catering facilities.

12.173 In the light of the evidence before them, the Commissioners are of the view that the problem of insufficient staff canteens existed on AOD and some time thereafter. In fact, W3 Dr Henry Duane Townsend, Chief Executive Officer of AA did not deny in his oral evidence that staff canteen was under-provided. Although the situation has apparently improved, the problem has not been completely resolved. When W44 Heed gave evidence before the Commission on 27 November 1998, he testified that there were still complaints of insufficient catering for staff but confirmed that a small committee had been set up to look into the subject with a view to improving the overall situation, especially in the ramp handling areas.

[33] <u>Radio Frequency Interference ("RFI") on Air Traffic Control Frequency</u>

12.174 According to CAD, they have been receiving reports from airline pilots regarding RFI on air-ground Very High Frequency ("VHF") radio communication channels used by air traffic control since late 1994.

12.175 To address the problem, CAD used spare frequencies to replace the affected ones for communication in the event that there was interference with the normal frequency channels. Since 1996, six additional frequencies were used by air traffic control as extra backup to further safeguard flight safety.

12.176 RFI signals were being monitored and measured by the Office of Telecommunications Authority ("OFTA") from hill tops in Hong Kong and from aircraft operating in the vicinity of the Pearl River Delta area as well as along the coast of Guangdong on a weekly basis. Results of RFI monitoring were forwarded to the Mainland authorities monthly to help trace the sources and eradicate the problem. Investigation by OFTA indicated that the sources of RFI were in the form of spurious or intermodulation signals originated from some unknown paging stations along the coastal areas in the Guangdong Province. The issue has been raised by the Government with relevant Mainland authorities since December 1994.

12.177 The Mainland authorities have adopted a range of measures to tackle the problem including dismantling radio transmitters on top of hills, and closing down offending paging stations. Tighter control measures on paging stations such as limiting their transmission power and requiring them to install filters and isolators have also been introduced in some cities.

12.178 Since May 1998, a Technical Working Group was established with technical experts from Hong Kong and the Mainland authorities to step up co-operation in addressing the RFI issue. In addition, a Task Force has also been formed between operational personnel of Hong Kong and the Mainland authorities for quick exchange of RFI information, if necessary. CAD assured the Commission that with the spare frequencies available, air traffic operations at the New Airport had not been affected.

[34] Aircraft Parking Aid ("APA") Malfunctioning: a Cathay Pacific Aircraft was Damaged when Hitting a Passenger Jetway during Parking on 15 July 1998

12.179 At Kai Tak, aircraft parking was done with the assistance of air marshall. InCLK, APA was introduced. APA is a laser scanning device which directs the pilot to park the aircraft through a real time display unit. The APA display unit will give directions to the pilot as to positioning, steering instructions and when to stop. If the APA malfunctions for some reason, there is a "fail-safe" mechanism advising the pilot to stop. The APA display unit can be installed upon the façade of the terminal building or on a gantry. In the new airport, there are 28 Building Mounted APAs, nine Gantry APAs installed within the terminal area and 31 Gantry APAs installed at the remote stands. Safegate International AB ("Safegate") was the contractor for the design and maintenance of the APA system. APA is operated by a qualified marshall of AA who will be available to provide manual marshalling if for any reason the APA cannot be used.

12.180 On AOD, three of the APAs were not functioning. Safegate agreed that there were occasions prior to 15 July 1998 when the Gantry APAs were unable to give the necessary directions to the pilot. This, according to Safegate, was due to the height of the Gantry which affected the laser scanning angle, the stop position and the type of aircraft in question. Safegate alleged that if there was an error of APA, the fail safe mechanism would advise of an error. The air marshall would then give manual directions to the pilot to park the aircraft.

12.181 In reply to Safegate's allegation that APA was affected by the non-standard height of the gantry, AA argued that Safegate was aware of the dimensions of the gantries since early 1997 and no issue had been raised about this until after AOD when the problem appeared.

12.182 AA alleged that there was a problem with the detection software as APA could not display the correct type of aircraft. AA also said that there was a problem with APA's self calibration function which failed to detect a sensor problem in the relevant APA. Safegate denied both allegations. Safegate said its records revealed that the system always correctly displayed the aircraft type specified by the operator. Also, failure to detect a sensor problem was caused by human error of a staff number who inadvertently left the auto-calibration function disabled and this had nothing to do with the system.

12.183 All APAs were suspended from use from 15 July 1998. AA said it was due to an incident on 15 July 1998 where a Cathay Pacific aircraft was damaged during parking, allegedly related to the malfunctioning of a Gantry APA at a frontal stand. This incident will be described below. Safegate disagreed that APAs were not functioning properly. Nevertheless, enhancement was made to the software of Gantry APAs to increase the effective viewing angle of the laser.

12.184 Five out of 28 Building Mounted APAs had experienced non-operational incidents after AOD. Safegate suggested that there were two causes for this: (1) the installation of sponge washable air filters in the display units which curtailed airflow within the display units; (2) the unstable voltage experienced at the new airport which caused thermo fuses and resistors to trip. This was denied by AA who alleged that Safegate had failed to design the system with suitable cooling and in compliance with the agreed voltage variation capability.

12.185 To rectify the problem, Safegate removed the washable sponge filters from the display units and optimised the size of the thermo fuses and resistors to accommodate the voltage situation in the new airport.

12.186 Since 12 September 1998, all APAs at frontal stands have been put back to service. As at 17 September 1998, all Gantry APAs were successfully tested and were waiting for AA's decision to use them. Aircraft parking was not seriously affected during the suspension of APA as parking was directed by air marshalls.

12.187 The accident occurred at 7:41 am on 15 July 1998 involving a Cathay Pacific B-747 aircraft (CX260). The Cathay Pacific aircraft overshot the stop bar by about six metres during parking. As a result, its engine came into contact with the passenger jetway and damage was caused to the engine cowling and the lower cover of the fixed ground power housing on the airbridge. Fortunately, no one was injured.

12.188 The parking was directed by an APA with an air marshall being present to provide safety monitoring. Apparently, the APA was not working properly in that the laser sensor was unable to track the type of aircraft under parking. The inoperative laser sensor would have been identified by the system but for the inadvertent disabling of the auto-calibration function by a Safegate staff. When the air marshall realised that the APA was not working properly, he tried to signal the pilot to stop. The air marshall could have pressed the emergency stop button on the control panel of the APA to effect the display of "Stop" message on the display unit to direct the pilot to stop. However, the control panel was outside the reach of the air marshall who would have to take more than 10 seconds to reach the panel. The air marshall therefore gave manual emergency stop signals to the pilot. The pilot apparently misunderstood the signal of the air marshall and the floating arrows on the APA display unit as a direction to move forward. When the pilot realised the emergency stop signal and stopped the aircraft, it had overshot by about six metres and had hit the passenger jetway.

12.189 After the incident, all APAs were suspended from operation for 16 days as described under paragraph 12.183 above. Safegate also carried out certain remedial actions: (1) the laser unit concerned was replaced and tested; (2) all the stands were checked to verify that the auto-calibration test was properly enabled; and (3) documentation showing individual stands' correct configuration data had been printed and signed off by Safegate and countersigned by AA. AA was considering the reinstallation of the control panel of the APA so that emergency stop could be activated by the air marshall in case of problem.

12.190 This was a single incident and no further accident was reported involving the parking of aircraft.

[35] <u>An Arriving Passenger Suffering from Heart Attack not being Sent to Hospital Expeditiously on 11 August 1998</u>

12.191 There were complaints that on 11 August 1998, an arriving passenger with heart attack on board China Southern Airlines Limited flight CZ3077 from Hainan to Hong Kong was not sent to hospital expeditiously. It was alleged that it took about 20 minutes for an ambulance to reach the patient on board.

12.192 According to the facts gathered by the Commissioners from the parties involved in the incident, at about 10:56 am on 11 August 1998, the Fire Services Communication Centre ("FSCC") of Fire Services Department ("FSD") received through '999' an emergency call made by a person using mobile phone on board flight CZ3077 that a passenger was suffering from heart disease. At that time, it was understood that the relevant aircraft was already on the apron. The subsequent events are set out in the following chronology :-

10:57	Ambulance from CLK Fire Station was despatched.
10:59	Airport Main Fire Station Rescue Control ("AMFSRC") was informed to contact ACC and AOCC for arrangement of escort.
11:00	ACC was informed to provide escort.
11:01	Ambulance arrived at apron gate.
11:06	ACC escort arrived.
11:09	Ambulance arrived at the aircraft and reached the patient on board.

12.193 According to the above chronology, it took thirteen minutes for the ambulance to reach the patient, not the alleged twenty minutes. To improve response time to emergency incidents like this, AA and FSD are already arranging a direct line between FSCC and ACC to be installed so that in future, requests for ACC escort vehicle do not have to go through AMFSRC. AA is also exploring with FSD possibilities of AA providing training for the Landside Fire Station ambulance crew on driving in PTB and Cargo Apron areas and qualifying them for driving at airside so as to eliminate delay in waiting for escort at the apron gate.

[36] Fire Engines Driving on the Tarmac Crossed the Path of an Arriving Aircraft on 25 August 1998

12.194 On 25 August 1998, four fire engines drove across the runway to attend to an incident of a JAL aircraft without obtaining permission from the ATC, forcing a Cathay Pacific flight to abort take-off and a China Eastern Airlines flight to delay landing.

12.195 According to the report of FSD on the incident, ATC informed the Airport Fire Contingent ("AFC") to respond to an incident whereby a small hatch door of a JAL DC-10 aircraft on a taxiway was in an open position. Four fire engines were dispatched. The Rescue Leader of the four fire engines radioed ATC Tower wishing to obtain clearance to cross the runway. Before he could obtain the necessary clearance, the driver of the first fire engine speedily drove across the runway without confirming permission from ATC nor the Rescue Leader. Upon seeing the first engine crossing the runway at high speed, the Rescue Leader considered that instructing it to return would only lengthen the time of the fire appliance staying on the runway which would further obstruct runway operation. Seeing that the aircraft at the threshold of the runway was stationary, he quickly followed with the remaining three appliances and dashed across the runway.

12.196 According to the report on the incident of CAD, ATC saw the fire engines crossing the runway without permission while the Rescue Leader reported on radio that they were responding to the request for inspection of the JAL aircraft. At that time, Cathay Pacific Airbus A340 aircraft cleared by ATC for take-off had just started its take-off roll and an incoming China Eastern Airlines Airbus A320 aircraft was approximately five kilometres from the airport. Instruction was immediately given by ATC to A340 to abort take-off. A340 stopped at about 200 metres from its take-off commencement position and by that time, the fire engines had already crossed the runway at a location some 1,400 metres further down the runway. There was no risk of collision. A340 was then instructed by ATC to vacate the runway. The Air Movement Controller judged that the runway would not be available in time for the approaching A320 to land and instructed it to discontinue its approach. No danger to safety was involved.

12.197 It was later confirmed that the reported unclosed hatch door of the JAL aircraft was in fact a valve in a proper position.

[37] A HAS Tractor Crashed into a Light Goods Vehicle, Injuring Five Persons on 6 September 1998

12.198 On 6 September 1998, a tractor of HAS crashed into a light goods vehicle (a control van), injuring five persons. The driver of the tractor towing two empty containers and an empty dolly was driving in the restricted area of the airport from the south towards north. As he was driving between two lines of containers, his view was partially blocked on the left while he was going out of the area and he was not aware of the arrival of the light goods vehicle. The tractor collided with the control van passing horizontally in front. As a result of the collision, five persons on the control van sustained injuries. All but two were immediately discharged after medical treatment and none was hospitalised.

[38] Tyre Burst of United Arab Emirates Cargo Flight EK9881 and Runway Closures on 12 October 1998

12.199 On 12 October 1998, United Arab Emirates Airline flight EK9881, a cargo B747-200 aircraft leased from Atlas Air, Inc, sustained tyre burst on departure for Dubai, leaving behind tyre debris on the runway. Tyre fragments covered an extensive area of the runway. The runway was closed for 40 minutes for removal of the tyre debris. About one and a half hours after take-off, the aircraft returned to Hong Kong on a slight hydraulic problem, damaging runway lights on landing. The runway was then closed twice, 39 minutes and 20 minutes respectively for inspection of the runway conditions and emergency repairs to the lights. Further repairs to the lights were made overnight.

12.200 The incidents, which necessitated the closure of the runway three times in a day, had an impact on the operation of the airport. To maintain the integrity of the runway for the safe operation of the airport, runway closures were necessary to remove the tyre debris and effect repairs to the runway lights. During the runway closures, four aircraft were diverted to alternative airports, 42 arriving flights were delayed between 15 and 69 minutes and 88 departing flights were delayed between 15 and 75 minutes.

[39] Power Outage of ST 1 due to the Collapse of Ceiling Suspended Bus-bars on 15 October 1998

12.201 This item is dealt with in para 11.15 of Chapter 11.

CHAPTER 13

RESPONSIBILITY -- FIDS

Section 1 : History of Development, Installation, Testing & Commissioning of FIDS – Delays and Problems

13.1 Flight Information Display System ("FIDS") is a highly sophisticated "state of the art" system serving a number of important functions essential for airport operation. A diagrammatic illustration of FIDS and other airport systems connected to it (excluding certain systems like the Time of Day Clock which are not relevant for present purposes) is at **Appendix XIV**. It can be seen from this illustration that FIDS interfaces with a number of other systems, which are developed by a number of contractors or suppliers.

13.2 There are the following contractors, subcontractors and suppliers:

(a) For FIDS, the main contractor of Airport Authority ("AA"), under contract C381, is G.E.C. (Hong Kong) Ltd. ("GEC"), and under it there are two main sub-contractors: (i) Electronic Data Systems Limited ("EDS") who is responsible for the system hardware except the liquid crystal display ("LCD") boards and the development of the software, and (ii) EEV Limited ("EEV") who is responsible for supplying the LCD boards.

(b) Under EDS, The Preston Group Pty Ltd ("Preston") is the subcontractor for the provision of the Terminal Management System ("TMS"), an integral component of FIDS. The monitors were supplied by EDS' sub-subcontractor FIMI-Philips S.r.l. ("FIMI").

(c) The main contractor for Baggage Handling System ("BHS") is Swire Engineering Services Ltd ("SESL") under contract C360.

(d) For the Airport Operational Database ("AODB"), Hughes Asia Pacific (Hong Kong) Limited is the main contractor under contract C399, and Ferranti Air Systems Limited the sub-contractor who designed and developed the software.

(e) The Common User Terminal Equipment ("CUTE") network, used by the airlines, is provided by the Societe Internationale de Telecommunications Aeronautiques ("SITA").

13.3 Another diagram in colour, **Appendix XV**, shows the four functions of FIDS, namely, generating in red, processing yellow, transmitting blue and presenting purple. The main components of FIDS include the following:

(1) FIDS Workstations - there are 18 PC workstations located at the Apron Control Centre ("ACC"), Airport Operations Control Centre ("AOCC") and Baggage Control Room ("BCR") where the Airport Management Division ("AMD") and BHS operators are able to monitor or enter data into FIDS and TMS through a number of pre-designed screens/windows or Man Machine Interface ("MMI"). The airlines are also able to access FIDS via the CUTE network workstations provided by SITA (288 check-in desks, 54

transfer desks and 86 gate desks), which run a FIDS software provided by EDS.

(2) FIDS Host Server - the FIDS host comprises an integrated software performing (A) stand, gate and desks allocation and (B) flight information display, with a common Oracle database for both parts of the software.

(A) TMS - this component is a resource allocation system and performs the following main functions:

(i) Stand allocation - TMS automatically optimises the allocation of parking stands for aircraft (both frontal and remote) at the new airport based on the flight schedules for each day and in accordance with certain preset rules. Optimisation means that the allocation of parking stands for aircraft would be made in a most efficient and desirable manner, taking into account their arrival and departure times. This function is performed using the FIDS workstations in the ACC. The stand allocation produced by the TMS optimisation process has to be confirmed by the ACC operators, who could also manually override the allocation produced by the optimiser.

(ii) Gate and Desk Allocation - these functions optimise the allocation of gates (mainly apron passenger vehicle ("APV") gates) and desks (both check-in and transfer desks) in a similar way to the stand allocation function. This part of the system is operated and accessed through the FIDS workstations in the AOCC.

(iii) Data Input - since TMS and the FIDS display software share the same database, stand, gate and desk allocations produced by TMS do not have to be manually input into the system before other components of the system or other connected systems could access the information. However, TMS is capable of being used for data input independently of the optimiser function. Indeed, if the stand allocation optimiser function is not used for any reason, the only way that the stand allocations (produced by Stand Allocation System ("SAS") or manually by ACC staff) could be properly displayed by FIDS is to have such data manually input through TMS.

(B) Flight Information Display - this part of FIDS is represented by the small box marked "FIDS" within the big yellow box on **Appendix XV**. As stated above, the display software shares the same database with TMS. Thus the stand, gate and desk allocations, once confirmed in TMS, will be automatically available to the display software and the various systems connected with FIDS, like CUTE, AODB and BHS. FIDS also receives relevant flight or flight related information from the AODB, CUTE and BHS and sends data to the display servers for further transmission to the display devices.

(3) Display Servers - there are altogether 57 display servers installed in various Communications Rooms throughout the Passenger Terminal Building ("PTB") which drive various groups of display monitors and LCDs throughout PTB. These display servers receive flight data from the FIDS host and determine which data are to be displayed on the display devices.

(4) Display devices - under the contract there should be some 146 LCDs and 2,057 monitors throughout PTB displaying relevant flight information at different locations in PTB.

According to GEC, on airport opening day ("AOD") 142 LCDs and 1,952 monitors were available, of which 137 and 1,913 respectively were working throughout the day.

13.4 The interaction between the various airport systems depicted in **Appendix X** can be briefly summarised, as follows:

(a) AODB is the main repository or "post office" of operation data, mostly flight-related. AODB receives data from various sources and distributes them unmodified to the various connected systems. Flight data from FIDS and Civil Aviation Department ("CAD"), for example, are connected to and made available to each other through the AODB linkage. One of the most important data supplied by CAD to TMS is the estimated time of arrival ("ETA"), which is available when the aircraft is within the range of the Radar Tracker, ie, 45 minutes before landing.

(b) The interface between FIDS and BHS enables the exchange of information relating to baggage handling, like stand allocations for inbound and outbound flights and lateral and baggage reclaim allocations for departing and arrival bags.

(c) Another important system connected to the AODB is the Flight Data Display System ("FDDS"), which is designed and built by Hong Kong Telecom CSL Limited ("HKT"). End-users of the FDDS (including Flight Display Data Feed Services ("FDDFS")) service receive flight information or data they require via the FDDS/FDDFS servers, which in turn receive the information from AODB. It is noteworthy that amongst the receivers of flight information via FDDS are the three ramp handling operators ("RHOs") and both cargo terminal operators ("CTOs").

13.5 The contract C381 dated 16 June 1995 made between AA and GEC as the main contractor was for GEC to provide FIDS, including software and hardware. From the very beginning, the FIDS software was plagued with problems. Translation of AA's user requirements as set out in the particular technical specification ("PTS") into functional requirements in the system segment specification ("SSS"), according to which the system would be designed and developed, took some 12 months longer than expected. This was due to the admitted ambiguity of the PTS, and the many subsequent changes to the SSS requested by AA. The changes were in turn the result of the relatively late involvement of the present AMD, the user of the system, in the specification phase. In March 1997, the development of FIDS was severely set back when AA and EDS agreed that the level of complexity of AA's user requirements would not be met by EDS either modifying one of their existing software or by buying a ready product off the shelf. As a result, EDS had to start from scratch to develop an entirely new software for AA. This caused a delay of 14 months and additional costs. An agreement was subsequently reached between AA and GEC to settle the delay up to 10 December 1997 and for additional costs, at $89.7 million to be payable by AA to GEC. This late development of FIDS resulted in the time that was originally planned for installation, testing and commissioning of FIDS, for integration of FIDS with other systems and for training of operators of the systems to be hard compressed.

13.6 In September 1997, there were discussions amongst AA, GEC and EDS as to how to recover from the further slippage that was experienced in the development of the FIDS software. It was then decided that the system should be divided into various builds, with each build designed for a particular functionality, namely, build 1.0 for control and monitoring of external interfaces, build 1.1 for integration with AODB, build 1.2 to provide the core host server data processing functionality for integration with AODB display panel, build 1.3 for the production and maintenance of screen formats to display on the FIDS display devices, build 1.4 to provide interface with CUTE, build 1.5 to provide FIDS with seasonal schedule and TMS facilities, and build 2.0 to incorporate all previous builds, including the MMI functionality. The development of the FIDS software in builds enabled AA to monitor EDS' progress. EDS delivered each build as soon as it was completed to the Interface House, a facility of AA used for the testing purposes, so that each portion of FIDS, providing a certain functionality, would be tested and be available for use for hands-on training of airport operators as soon as possible. Each build could have been developed to work as a standalone system, ie, to work independently without being linked up or integrated with any of the other builds. With standalone builds, AA would have had a fallback on these unintegrated functionalities for airport operations, should the integrated FIDS run into problems.

13.7 Unfortunately, the development of the integrated FIDS proceeded without consideration of a fallback, and when AA and EDS stopped to consider the re-development of the standalone builds, it was already too late for meeting the April 1998 AOD. Build 2.0 incorporated and integrated all previous builds, and was delivered to PTB in December 1997. However, there were numerous problems identified, termed problem reports ("PRs"), during the various tests from thence up to AOD. The final build of FIDS, with a great number of PRs critical to airport opening fixed, was delivered around 23 June 1998, and a new release of TMS having a memory leakage problem corrected was made at the end of June 1998.

13.8 Earlier in December 1997, at the time when airport opening was expected to be in April 1998, there had been a further agreement between AA and GEC that the factory acceptance test ("FAT") of the FIDS software was to be combined with the site acceptance test ("SAT"). FAT was meant to test the software at EDS' premises in Hook, England, so that any PRs revealed could be fixed before the software was to be delivered to site, ie, the new airport. The software delivered to and installed at site would then be subject to SAT when there would be fewer problems, as those identified at FAT would have already been fixed. SAT was meant to unearth problems encountered when the software was set up at site, and these PRs would then be resolved. According to the contract between AA and GEC, FAT was to take place in EDS' premises in Hook, and that would take place before the software was delivered to the new airport. The combination of FAT and SAT was aimed at catching up some time that had been lost previously, so that problems with the software would be identified at one and the same time during the combined tests and such problems resolved at the new airport collectively. This agreement was made with objection from EDS which maintained the view that a combined FAT and SAT would add risk to the completion of a problem-free product as certain software errors were best identified and rectified in the factory environment.

13.9 At the first airport trial on 18 January 1998, FIDS as installed at PTB crashed. It was discovered that FIDS and CUTE used by airlines were not compatible. In the Airport Development Steering Committee ("ADSCOM") meeting on 14 February 1998, W43 Mr Douglas Edwin Oakervee, the Project Director of AA, explained that the problem at the time was caused by the fact that SITA, the contractor supplying CUTE for use by the airline operators, had loaded the software for CUTE incorrectly. Subsequently, SITA flew in an expert from New York to resolve the problem. In the ADSCOM meeting on 22 May 1998, AA reported that the FIDS/CUTE interface had been completed and that SITA had provided the certification to FIDS in the form of an e-mail advice on 6 May 1998. However, even in the final airport trial on 14 June 1998, there were reports about the slow response experienced by Cathay Pacific Airways Limited ("Cathay Pacific") and Hong Kong Dragon Airlines Limited ("Dragon Air") in accessing their Departure Control System ("DCS") through CUTE, which according to Cathay Pacific was caused by the failure of the communication links between PTB and SITA's overseas sites. After some system improvements by SITA, the airlines organised in conjunction with AA a large-scale dry run of CUTE on 30 June 1998. Thirty-two or 35 airlines participated in the exercise and their operators logged in at 80 check-in counters simultaneously. These operators operated the FIDS/CUTE interface and DCS. AA operators also tested the standby FIDS, a contingency more particularly referred to below in case of failure of the main FIDS, according to the procedures prescribed by AA. No problem was noticed nor afterwards reported during this dry run.

13.10 Apart from the interface problem between FIDS and CUTE, FIDS was not running smoothly. It was continuously plagued with problems and Government kept on reminding AA of the necessity to have a stand-alone system to work as a fallback in the event of a FIDS breakdown. At the AA Board meeting on 26 February 1998, the AA Board finally directed the AA management to procure a separate standby system ("standby FIDS") that would function as a fallback if the main or permanent FIDS could not be delivered on time or failed. At the AA Board Meeting on 23 March 1998, it was also decided that a standby SAS should be commissioned as a fallback should TMS fail. SAS is a stand-alone system and does not interface with FIDS.

13.11 There were a number of tests of FIDS, although they were carried out later than the contractual timetable or planned dates. Out of the initial contractual term for commissioning the whole system in three years, 14 months had been lost in its development by early 1997. The remaining time for the completion of the work was tight, involving a risk which was appreciated by EDS. The altered timetable agreed between the parties for the delivery of the builds and testing and commissioning was "aggressive", as described by the project engineer of EDS, W21 Mr Michael Todd Korkowski. He told the Commission that there was a delay in the delivery of each build, which affected the testing programme. The integrated FIDS, that is FIDS and its interfaces with AODB, BHS, FDDS, Aeronautical Information Database, Mass Transit Railway Corporation and Scheduling Committee Computer, was run continuously for two weeks leading up to AOD, to test the processing of flight data. The test revealed the need for Central Processing Unit ("CPU") upgrade and additional memory in the system . However, W21 Korkowski was not sure whether those other systems were in full running mode, eg, whether BHS was actually moving bags or whether all the check-in desks were running on the FIDS/CUTE interface. A fully simulated live load operation was never performed on FIDS and its interfaces and the closest thing was when FIDS was used during the fifth airport trial that took place on 14 June 1998.

13.12 W21 Korkowski told the Commission that the variations requested by AA and the five airport trials from January to 14 June 1998 were outside the contractual terms. The variations required testing and the airport trials needed a lot of preparation by EDS personnel. These additional requirements diverted EDS' concentration on resolving PRs. He produced a list to show that altogether over 12,000 man-hours had been taken off their key resources that could not be replaced, and a month of delay was the consequence.

13.13 FIDS is composed of hardware and software. For the purpose of the inquiry, two hardware components were of significance, namely, the LCD boards supplied by EEV, and the monitors supplied by FIMI. The monitors and LCD boards display flight-related information such as flight times, check-in desks, boarding gate numbers and reclaim belt assignment to passengers. Most of the flight information displayed on the monitors and LCD boards would be disseminated through 57 display servers which were fed with the data by two host servers.

13.14 Mr Raymond HO Wai Fu, Chief Assistant Secretary for Works (Information Technology) of Government, stated that he noted from the FIDS daily report prepared by AA on the reliability tests carried out in June 1998 that there were two incidents of major failures of display servers, although the accumulated availability of the host servers was satisfactory during the initial period between 14 June and 18 June 1998. The first one occurred on 18 June 1998 involving seven servers and the other one occurred on 19 June 1998 involving 16 servers. At the time of the report, AA recognised that the major failure of display servers was a serious concern and that GEC and EDS and their subcontractors were trying to resolve the problem as soon as possible. On 22 June 1998, Mr Raymond Ho noticed from the daily FIDS reports that there were some problems on the display servers which failed to update some of the display devices. Consequently there were inconsistent information between display monitors.

13.15 The 1,952 monitors and 142 LCD boards were themselves not free from trouble. According to the contractors, many monitors were delivered to PTB in 1996 and kept there before the air-conditioning system was operating. Subject to heat and moisture, many connectors were oxidised and the voltage level at the end of the cable reduced. About 20 monitors were damaged by water. Many of the other monitors were subject to problems such as software errors, operator errors, cable length, data cable integrity and even lack of power supply. The length of the cable between the display server and the monitor or LCD board was not to exceed 90 metres or else the display performance would be affected. At the current design, 30% of the display devices had cables over 100 metres and 5% over 150 metres. W3 Dr Henry Duane Townsend said he also knew of this cable length requirement, but by installing more display servers at various locations, the cable length would be shortened. On AOD, according to W22 Mr Edward George Hobhouse, the project manager of GEC at PTB, about 93.8% of LCD boards and 93% of monitors were working, that is, 32 monitors and 2 LCD boards malfunctioned on AOD. About 120 monitors were replaced in the three weeks after AOD. However, W22 Hobhouse said that that was within the expected failure rate of monitors which was about 200 a year, ie, 10% out of the roughly 2,000 monitors installed.

13.16 According to the Daily Report dated 22/6/98, FIDS resilience tests would be carried out on 25 June 1998 and stress and loading tests on 26 June 1998. These tests would serve to verify if the system could perform under load as designed. However, the Daily Report dated 28/6/98 stated that the resilience tests were rescheduled to 30 June 1998 and the stress and loading tests deferred until after AOD. The Daily Report dated 2/7/98 recorded that formal resilience tests would be carried out after AOD. Mr Raymond Ho stated that he had reservations about the lack of these tests, but considered that it was a matter for AA, its contractors and consultants to decide the testing requirements for the commissioning of the systems. He was not advised by AA of the risks of operating a FIDS which had not been through a stress test.

13.17 While maintaining that FIDS was operational and functional on AOD, W21 Korkowski, the project engineer of EDS stationed at PTB, frankly admitted that no stress test that should have been undertaken before AOD was performed. Although there was no specific requirement for a stress test on FIDS in the contract between AA and GEC, a stress test was industry practice for an important system on which operations depend, and would have taken EDS three to five days in preparation and one or two days in carrying out. W21 Korkowski agreed that with hindsight he should have advised AA or CSE International Limited ("CSE"), AA's consultant on systems, of the risks of not performing a stress test before AOD, which he failed to do. He also said that AA and CSE should have known the significance of a stress test. As EDS had at the period starting from 9 June 1998 at least 38 PRs to rectify, there was no time to carry out the stress test. That reflected the compressed timetable for testing since the loss of 14 months at the early stage of the development of the software and continued slippage thereafter. Mr David John Thompson, a senior coordinator of New Airport Projects Co-ordination Office ("NAPCO") for special systems from International Bechtel Company Ltd. stated in his witness statement that he was aware that the FIDS stress test had been deferred at the very last minute. He believed that there was insufficient time to carry it out. FIDS exhibited problems related to operational stability and given the time constraints leading to AOD, he believed that resolving stability problems and ensuring Day One functionality was of far higher concern to AA and EDS than stress testing, which in any event would normally only be performed on a stable system. Mr Thompson claimed that in the case of FIDS, a stress test would have most probably indicated that the system was slow in responding to operator input, which in itself would not necessarily have been catastrophic for Day One operations had there not been other simultaneous problems. According to W55 Dr Ulrich Kipper and W56 Professor Vincent Yun SHEN, experts appointed by the Commission, a stress test would probably have revealed slow response to operator input and certain deadlock problems in the database. These two problems hampered ACC and AOCC operations on AOD, especially when operators were trying to catch up with time lost in the early morning due to difficulties performing flight swapping. These problems were in fact known to AA and EDS before AOD, but their reappearance in a stress test might have highlighted their significance on a fully loaded system, and thus the need to resolve them before AOD. Bearing in mind that any test is only as good as the measures taken to resolve the PRs, and considering the limited time EDS and AA had to solve PRs before AOD, it is uncertain if a stress test performed on the problem-ridden system and in compressed conditions would have saved the day. Yet, the Commissioners note that it was industry practice to carry out the test before operations. This highlights the serious risks that AA faced with their operation systems in the build-up to AOD and the dire need for a global contingency plan.

13.18 W22 Hobhouse placed importance on a confidence trial involving operations staff working on the system before AOD, which would have given them a measure of confidence in operating FIDS. He told the Commission that a stress test would take place prior to a confidence trial, and such a trial should have been carried out before AOD, but it was not done. He described FIDS as workable on AOD, with TMS almost there, running as a planning and allocation tool on Day Three, and that by Day Six operation was as good as at Kai Tak. On the other hand, he did not deny that there were a lot of problems on AOD and that FIDS was not operating efficiently then.

13.19 In his witness statement, W28 Mr Anders YUEN Hon Sing, the Assistant Airfield Duty Manager of AA stationed in ACC, wrote that at the multi-system reliability tests from 8 to 23 June 1998, a number of problems with TMS/FIDS were encountered, namely,

(a) extreme slow functioning of the system;

(b) use of the optimisation command would often cause the Gantt chart to freeze or shut down;

(c) incorrect display of flight data (TMS would split the display of a linked arrival and departure, thus showing double the number of actual flights and sometimes a number of flights would be missing from the chart altogether);

(d) the inability to print a full Gantt chart (the screen could not display a full Gantt chart on one view); and

(e) the "what if scenario" planning function was not available.

13.20 W24 Ms Rita LEE Fung King, FIDS Project Manager of AA's Information Technology ("IT") Department told the Commission that there were also concerns at the instability of the TMS server. When giving evidence before the Commission, W28 Yuen, W23 Mr Alan LAM Tai Chi, AA's General Manager (Airfield Operations) and W24 Lee clarified that the above problems were to a certain extent fixed before AOD. However, slow response time improved only slightly and suspicions by AA that there were problems with the TMS server persisted even on AOD. The “what if scenario”, which would only be used once in a month for planning, was not critical for AOD and was to be available only in October 1998.

13.21 W28 Yuen relayed these problems to W23 Lam on a number of occasions. W23 Lam took the decision in consultation with W44 Mr Chern Heed and AA’s Mr Thomas Lam to use SAS and not TMS to produce the preliminary stand allocation schedule. As the SAS and TMS systems had different software configurations, they produced different stand allocations, even though they were programmed with the same stand allocation rules. This decision means that SAS would be used on AOD for optimisation of the allocation of parking stands for aircraft, and because SAS did not interface with FIDS, the stands so allocated by SAS would have to be manually entered into TMS through the FIDS MMI for dissemination and display on FIDS.

Section 2 : What was Wrong with FIDS?

13.22 From the evidence of the observers of the FIDS displays and operators of FIDS, as detailed in Section 2 of Chapter 10, the following visible problems are identified:

(a) The flight information displayed on the FIDS monitors and LCD boards was incorrect, inconsistent and incomplete, and the monitors and LCD boards were sometimes blank or blacked out;

(b) ACC operators were not able to perform the flight swapping function initially, and had to learn the correct method from W24 Lee and Preston later on;

(c) Response time was slow with TMS and FIDS MMIs at ACC, AOCC and BCR, resulting in very slow update of information into FIDS;

(d) The Gantt chart on TMS shut down intermittently; and

(e) Green bars appeared on the Gantt chart on TMS indicating that ETA was earlier than scheduled time of arrival ("STA") by more than 15 minutes.

13.23 GEC, EDS and Preston, the contractor and subcontractors in the supply of FIDS including TMS and the monitors and LCD boards should be the people who had intimate knowledge of the underlying causes for the problems as observed. According to them, the causes were as follows:

(a) The monitors and LCD boards displayed obsolete data because the display servers sometimes locked up, preventing receipt of updated data. An operator-controlled switchover would cause the monitor to blank out for about five minutes while the substitute server was receiving a download of data. A LCD board would be blanked out completely when the connection to the display server was lost. There were also hardware problems that affected the availability of monitors and LCD boards, such as lack of power, incorrect cable lengths and networking problems.

(b) They did not know that AA did not use TMS as a stand allocation planning tool with its optimisation function. Using TMS to input stand allocations produced by SAS, as AA staff did on AOD, was not a designed use. Had they known, they would have raised concerns or advised AA as to how to update TMS properly by manual input. Using SAS for optimisation and manually entering the allocation obtained from SAS into FIDS increased the workload of the AA operators.

(c) There were two FIDS MMIs in ACC. If the Gantt chart on one of them shut down, the other could be used to create another Gantt chart, with little impact on operations.

(d) Green bars were a system design in TMS to show that ETA was earlier than STA by more than 15 minutes. The green bars appeared in accordance with the design and they did not indicate a software problem.

13.24 The contractors and subcontractors also said that the operators of the AA, airlines and BCR were not familiar or experienced with using TMS and FIDS MMIs and therefore caused problems. AA did not ask EDS and Preston personnel for assistance immediately upon AA's staff experiencing difficulty operating TMS. AA did not confirm the stand for turnaround flights until ETA was received, which was in some cases about 15 minutes before the landing of the arriving flight, which resulted in RHOs not knowing where to find the aircraft and in gates not being able to be assigned as CUTE would not allow the airline to log on until the stand was allocated. All these had nothing to do with the integrity of FIDS.

13.25 Except for the cabling problem, W21 Korkowski admitted that EDS was responsible for the quality and commissioning of the monitors that were supplied by its sub-subcontractor FIMI. GEC, on the other hand, was responsible for the quality and commissioning of the LCD boards that were supplied by its subcontractor EEV. While only 10% of the monitors and LCD boards did not function, for whatever reasons, on AOD, the impact would not have been serious had FIDS worked properly and smoothly. This is because each malfunctioning display device affected only a small group of end-users, who could have been directed to the nearest working display.

13.26 W23 Lam told the Commission that a decision was made in June 1998 that on AOD, TMS would not be used for stand allocation planning, which would instead be performed on standby SAS developed by City University ("City U"). Both SAS and TMS had the function of optimisation for such planning. While SAS had only the function of planning stand allocation and was a standalone system unintegrated with any of the other systems used in the new airport, TMS also had the functions of allocating gates and check-in and transfer desks, and it was part of FIDS and therefore integrated with many other systems. This difference meant that stand allocations produced by TMS could be disseminated through FIDS to users without extra effort, while SAS allocations had to be manually entered into TMS via FIDS MMI before the information could be published on FIDS display devices. The decision to use SAS as the primary stand allocation tool was made mainly because the performance of TMS during various tests up to the middle of June 1998 was unreliable for the reasons cited in paragraphs 13.19 to 13.21. The staff at ACC were all drawn from Kai Tak and they had the experience of operating Kai Tak's stand allocation system that was similar to SAS. SAS was able to print out the Gantt chart prepared by it whereas TMS was unable to do so when the decision was taken. Although the performance of TMS showed improvement when reaching AOD, the decision was not altered.

13.27 W23 Lam told the Commission that on 5 July 1998 at about 4:30 pm, the scheduled flight information was loaded into both SAS and TMS. From both systems, a Gantt chart was created on the workstations, and stand allocation planning using the optimisation function was employed in each, but for different purposes. SAS was used as the primary tool for stand allocation, and the allocations made by it would be adopted for operations. On the other hand, the optimisation function of TMS was used purely for stands to be allocated on its own Gantt chart so that any allocations that were not identical to those made by SAS would be altered accordingly from time to time when required by manual input. The necessity of using TMS in this way was to enable FIDS to be updated with allocations from SAS and for dissemination of the updated information to the other systems interfaced with FIDS, with which SAS had no link.

13.28 W23 Lam further said that as aircraft from Kai Tak arrived at the new airport as from 9:15 pm on 5 July 1998, stands were allocated to these flights on TMS in accordance with the schedule prepared on SAS. Updates were input into SAS and similarly into TMS. For all these ferry flights, ACC staff entered chocks-on time and the registration number in the FIDS MM1. However, in doing so, W28 Yuen invoked a prompt linking flights by registration number. This would inhibit flight swapping by manual linking procedures later on. At about 1 am on

AOD, when ACC received flight movement sheets from Cathay Pacific requiring flight swaps, ACC operators were unable to execute the flight swapping command because they were unfamiliar with the progression of the levels of flight linking and did not know how to use the method of swapping by aircraft registration numbers. Difficulty was also experienced with attempts to carry out flight swapping on SAS to the extent that at about 2:30 am, SAS crashed. Thereupon, City U was contacted for help. With both systems hung, a manual system of stand allocation was set up by ACC staff. The manual system consists of a whiteboard set up with a printed copy of the SAS Gantt chart with all the stands available and with flight numbers and aircraft registration numbers (or tail numbers) on stickers for adhering to the allocated or assigned stands. The stands allocated manually would have to be manually entered into TMS/FIDS through the FIDS MMIs, so as to disseminate the information through FIDS to other systems of the new airport. When a City U representative came to ACC with a workaround for SAS at about 8:30 am, ACC staff had gone quite far with using the manual allocation. However, the problems encountered with TMS remained, and the operators at ACC had difficulty in inputting the stands allocated, especially for swapped flights.

13.29 W29 Mr CHAN Kin Sing, a colleague of W28 Yuen on duty at ACC on AOD, told the Commission that he called the IT Department of AA when problems with flight swapping were first encountered at around 2 am. A female person who answered his call told him that she would go to check the server, but nothing was heard from her afterwards. W28 Yuen told the Commission that he telephoned W24 Lee at about 3 am and asked for help. After this call, he did not hear from her and was not able to contact her. On the other hand, W24 Lee testified that the first time she heard from ACC was at 6 am, before which she was going round PTB to inspect FIDS displays and the operation of the CUTE workstations by airline staff at the check-in counters. She immediately called W21 Korkowski who directed her to call W35 Gordon James Cumming, also of EDS.

13.30 W24 Lee arrived at ACC at about 6:30 am on AOD. She helped the operators with flight swapping and with confirming stand allocations entered manually into TMS. W23 Lam, who gave evidence with W24 Lee in a group, was also in ACC from the small hours of the morning and witnessed what happened at ACC and W24 Lee's arrival. W24 Lee was conversant with IT matters and the operation of FIDS and TMS. Her ability in IT matters and operation of FIDS was not doubted by W21 Korkowski.

13.31 According to both W23 Lam and W24 Lee, the ACC staff had a lot of problems in inputting data into TMS. The updating of flight schedules could not catch up with the real time situation. The input of stand confirmation, chocks-on and chocks-off times, and aircraft tail numbers could not be made in time, such that sometimes the aircraft were on the ground but the information had not been successfully entered into TMS. This was mainly caused by the slow response of TMS. Sometimes, the Gantt chart of TMS disappeared for between 5 minutes to one and a half hours. The operators had difficulty in confirming a particular stand, and experienced problems entering the aircraft registration number to break manual links.

13.32 On the corrupted flight data from CAD which was used by ACC before 8:30 am, W24 Lee said that while the ETA being earlier than STA by more than 15 minutes created green bars on Gantt chart, there were only very few such occurrences and they did not have a major impact on operations because they did not prevent her from performing flight swapping or confirmation.

13.33 On the other hand, W34 Mr Peter Lindsay Derrick said that when he arrived at ACC at 12:30 pm on AOD, he noticed that the Gantt chart on the TMS workstation showed Gantt boxes overlapping one another and in conflict. The data showed that the ETAs of the associated flights were significantly different from the scheduled times. It was then agreed between him and the AA staff there that the flights with ETAs should have the ETAs removed, leaving TMS with the original scheduled times for the affected flights. After this was done, the Gantt boxes returned to their planned times and the conflict conditions disappeared. From W34 Derrick's evidence, it is very clear that by 2 pm, the conflict had all been cleared. He said that while the invalid estimated times were in the database, TMS functionality was severely impacted.

13.34 W34 Derrick attributed the problems to causes either external or internal to TMS. The external causes were lack of experience of operators in using TMS Gantt chart, resulting in incorrect usage of TMS or receipt of incorrect input by TMS. His descriptions are as follows:

(a) Some manual links reverted to rotation number links. This was the result of the operators erroneously pressing the *Return* key when entering aircraft registrations for departure flights via the FIDS MMI. This had only a minimal effect on apron control operations.

(b) CAD sent invalid estimated time information. The CAD interface was shut down and invalid estimated times were removed from TMS. TMS functionality was severely impacted by the invalid estimated times in the database.

13.35 The internal causes described by W34 Derrick were as follows:

(a) Constraint error when *Confirming* some stands with TMS. When the operator, as advised, repeated the *Confirm* action, the operation would complete successfully. This had minimal effect on apron control operations.

(b) Gantt chart shutdown. This happened intermittently throughout the afternoon. The cause was later found out to be operators repeatedly pressing the *Apply* or *OK* button on the allocation dialog when the system did not respond as quickly as hoped. Although this was annoying for the operators, it had no effect on apron control operations.

(c) TMS did not behave as expected when flights were linked using the flight swap function, in two situations. Some manual links did not unlink when the aircraft registrations were input. However, to fix this, the operator could simply invoke the Unlink functionality on the button bar or allocation dialog. Another situation was that re-linking confirmed allocations did not always reconfirm the new re-linked allocation. This was simply fixed by asking the operator to reconfirm the allocations after re-linking.

13.36 W34 Derrick described the internal causes as minor internal issues, having only a negligible effect on apron control operations, and that they did not stop the operators from entering the planned stand allocation information into TMS. However, he also noted that some frustration was expressed as to the performance of TMS during the afternoon as some of the transactions were taking longer than hoped given the pressure the operators were under. The ACC staff also pointed out to him that during the course of the day, the flight swap function (Link) as delivered was not as efficient as was required for day to day operations of the new airport. He said that this particular function was discussed in detail with the operators long before AOD and the functionality was available to the operators when TMS was installed on the test systems at Interface House in late 1997. AA had ample opportunity to review the functionality before AOD and determine its suitability for airport operations, but no change requests were made to Preston.

13.37 W34 Derrick also said that the decision to use SAS, instead of TMS, to plan stand allocation was not within the knowledge of Preston until 5 July 1998, and intimated that this contributed to the problems encountered at ACC on that day. W21 Korkowski and W34 Derrick both also stressed that the use of TMS for inputting stand allocation planned by another system, namely SAS, but not invoking the optimisation function in TMS for stand planning was not a designed use, again intimating that such use would or did cause the problems. However, both W21 Korkowski and W34 Derrick did not deny that stand allocations produced by optimisation on TMS, could be altered by manual input and that manual input for alteration or to override the automatic allocation by optimisation was a proper function of TMS.

Moreover, all these persons responsible for FIDS agreed that there was a software bug with the Oracle database, which was part of FIDS that affected the performance of TMS. This was sometimes described as the shared pool memory problem, which was only fixed, either temporarily or permanently, days after AOD.

13.38 W27 Ms Yvonne MA Yee Fong, an IT Project Manager of Information Resource Management in AA's IT Department, gave evidence with W26 Mrs Vivian CHEUNG Kar Fay, the Terminal Systems Manager of AMD as a group before the Commission. She explained that the main cause for the slowness of FIDS was the deadlock problem. A "deadlock" occurs in a database with multi-user access to shared resources, like the database shared by FIDS and TMS, to which different FIDS and TMS applications need access. The database locks a record that an application needs to access, to prevent another application from using the same record before the first has completed access. If two applications, A1 and A2 need to access the same two records R1 and R2 in different sequence to complete their respective transactions, a deadlock results when A1 is accessing R1 and A2 is accessing R2. Both applications cannot proceed since the database has not unlocked R1 and R2 from the first part of their transactions. W27 Ma said that each time there was a deadlock, the operators had to wait for certain processes to finish before they could proceed to another, and that took up a lot of CPU resources.

13.39 The reason for the crashing of SAS, according to W28 Yuen's understanding, was that an attempt to carry out flight linking resulted in illogical times of the arrival and departure of corresponding flights, ie, the departure time of an aircraft was earlier than the arrival time of the same aircraft. Usually there were no problems with flight swaps. However, when for example there were three pairs of arrival and departure flights on the same day using the same aircraft, the aircraft would arrive three times and leave three times. One input of a swap would affect three departure flights, and the second departure flight might appear to leave before the third arrival time of the same aircraft. The illogicality was thus transient and would be corrected when the swaps relating all three pairs of flights were completed. However, SAS was not able to deal with this transient illogicality. This problem was never encountered with the stand allocation system used at the Kai Tak airport, but that system was different from SAS. SAS was therefore required to be altered after the problems encountered on AOD.

13.40 Dr CHUN Hon Wai of City U agreed that the transient illogicality was not acceptable to SAS. That was because SAS was designed to prevent operational errors from happening. He stated that the design was an improvement on the stand allocation system, also designed by City U, that was used in Kai Tak, so that no potential errors in SAS could cause other airport systems, which he expected would be linked with SAS, to crash. As it stood on AOD, SAS did not prevent flight swapping altogether, but the user had to correct the departure time before the swap.

<u>Section 3 : Repairs after AOD</u>

13.41 In order to understand the causes for the problems encountered with FIDS on AOD, the repairs done or solutions employed are most relevant.

13.42 Within three weeks after AOD, 120 monitors were replaced.

13.43 After AOD, City U altered SAS. The key feature was to disable the error checking to permit any type of illogical data to be input.

13.44 The problems with FIDS did not end on AOD. A number of witnesses gave evidence to the Commission that the system response remained slow for the first several days of operation. Serious problems also surfaced on Day Five when FIDS experienced a significant amount of locking and very high CPU utilisation. Major system changes, Changes 109 and 118, were effected that night to solve the WDUM problems and TMS locking, after which system performance improved significantly. Steps were also taken to increase the memory of the FIDS workstations in ACC, AOCC and BCR over the first few days of airport opening. W26 Cheung and W28 Yuen testified that FIDS performed efficiently and stably by about a week after AOD. The evidence of Cathay Pacific is that by around Day Four to Day Five, the information was largely but not always accurate, and it did not regain full confidence in the system until the week after AOD. There is similar evidence from RHOs. The details of the remedial measures taken for FIDS can be found in Section 3 of Chapter 10.

Section 4 : Causes and Responsibility

13.45 Having carefully considered all the evidence and submissions of counsel for the Commission and for the parties, the Commissioners come to the following findings and conclusions on the causes for the deficiencies of FIDS on AOD and the days thereafter as well as the responsibility for these causes. The major contributing causes to the deficiencies of FIDS were as follows:

(a) Compression of software development time.

(b) Insufficient software testing and rectification of software problems before AOD.

(c) Insufficient training and practice of operators on software functionalities.

(d) Lack of or late confirmation of stands.

(e) Lack of communication and coordination (i) within AA, (ii) between AA and other parties, and (iii) between GEC, EDS and Preston.

13.46 All the above causes are inter-related and cumulatively led to the problems witnessed on AOD and the first few days of airport opening. It is important to remember that each of the causes must be viewed in the context of all the other causes rather than in isolation. There were other minor contributing factors to the problems on AOD, such as monitors and LCD boards malfunctioning, SAS hanging and FDDS not fully performing.

(a) Compression of software development time

13.47 The compression of time is probably the single most significant underlying cause of the problems encountered by FIDS on AOD. Both W55 Kipper and W56 Shen, experts appointed by the Commission, extensively considered the importance of the time factor. The Commissioners agree with their opinion and highlight the following salient points in their expert opinions and the evidence:

(a) The software development programme for FIDS was probably an ambitious programme from inception, bearing in mind the high degree of integration and sophistication in the system design and the time available in which to develop it. The contract period was about 30 months, from June 1995 to December 1997 if confidence trials are included, or about two years from June 1995 to June 1997 if only the main software development part is counted. Either way, it was a very tight programme.

(b) The substantial time spent on agreeing on the SSS was, to say the least, unfortunate. As a result of the delay, software development had to start effectively from scratch in about November 1997, some 17 months after the contract had commenced. Despite the attempts to save time, including the agreement to break up the software into separate builds and combining the FAT with SAT, events proved that the lost time was never recovered. As W56 Shen incisively pointed out, history has proven that the time taken for the development of the software and for the "AOD version" of the software to work stably turned out to be very close to the original plan, which had been so drastically shortened.

(c) In view of the tightness of the programme, AA and the contractors should have been all the more vigilant to ensure that no significant slippage would be allowed. However, the evidence clearly shows that from June 1997 onwards the programme had been slipping. The revised substantial completion date, ie Key Day 4, under the settlement agreement of December 1997 was 6 March 1998 but was again revised to AOD. However, according to W25 Mr TSUI King Cheong of AA, that milestone had not even been achieved by end of October 1998 when he gave evidence.

(d) With a tight schedule, AA ought to have realised that any delay to the programme would be likely to cause compression of the “tail-end activities”, ie, testing, training and practice. However, the evidence shows that despite protests and early warnings from AMD to Project Division (“PD”) by way of W44 Heed’s memo to W43 Oakervee dated 4 April 1997, the development programme continued to slip throughout the latter part of 1997 and 1998. W44 Heed had agreed to the progress programme suggested by W32 Mr Jhan Schmitz of NAPCO in September 1997 that there should be a minimum “clear” period of six weeks after the system had been fully integrated and tested so as to enable training to be undertaken. Although W44 Heed did not agree that without that period of time for training and familiarisation for the operators of the airport, problems on AOD would be inevitable or that standard of service would be lowered, he accepted that it would be prudent to have that period of time. However, he told the Commission that there was new development to FIDS and TMS functionalities and workarounds in the last few days before AOD and TMS became a usable system only in the last three or four days before AOD. It is therefore clear that due to the compression of time, standards were compromised.

13.48 AA suggested that the original progress programme for FIDS agreed with GEC provided for confidence trials at the end of 1997, giving a float of four months before the then targetted AOD of April 1998. This suggestion is quite irrelevant because of the slippages experienced. The system ought to have been fully integrated, tested and stable for a suitable period of time before AOD so as to enable the operators to have proper training and familiarisation with the functionalities, which was no doubt one of the major reasons why the programme was originally scheduled to complete by end of 1997. In a memo from W44 Heed to W25 Tsui dated 4 April 1997, W44 Heed strongly protested against the reduction of trial duration from three months to two months. However, as W43 Oakervee put it, the three months clear trial period was evaporating all the way through 1997.

13.49 In September 1997, NAPCO and AMD were both of the view that a minimum "clear" period of six weeks after the system had been fully integrated and tested was required to enable training to be undertaken. W44 Heed's evidence is that this was already reduced from the three months he had planned for in April 1997. There is no conceivable reason to believe that the "clear" period should not equally apply at any other time but September 1997.

13.50 Moreover, the first airport trial was planned to take place in January 1998, when the FIDS was used but effectively failed to work. Nor did FIDS fare satisfactorily in the second airport trial on 15 February 1998. Thus the original objective of having the system development substantially completed by end of December 1997 was not achieved, and whatever float that was planned to have had gone under the drain.

13.51 For the compressed time for the development of the FIDS software, which badly affected the efficient operation of FIDS on AOD, AA, GEC and EDS should be responsible. The crucial slippage was the loss of 14 months after the commencement of the contract C381. In the Commissioners' opinion, this was caused by the user's requirements of the operators of the new airport, ie, AMD, being ascertained too late to be reflected in the original PTS used for contract tendering and in the admitted ambiguity of the PTS. From the settlement agreement resulting in $89.7 million payable to GEC, it appears to the Commissioners that GEC and EDS were not responsible for this crucial slippage. AA must therefore be solely responsible for it. However, for the slippages from the end of 1997 to AOD, the evidence indicates that both AA and EDS are responsible, although the evidence is not sufficient for the Commission to make any proper apportionment of such responsibility. This will remain a matter of contractual dispute between AA and GEC, and probably between GEC and EDS, for there is no priority of contract between AA and EDS.

(b) Insufficient software testing and rectification of software problems before AOD

13.52 The slow system response was a major contributing factor to the problems on AOD and the few days thereafter. Although EDS and Preston hotly disputed the extent and inception of the slowness, all who had given evidence before the Commission agreed that FIDS did respond slowly to the commands of the operators. Mr C K Chan said that TMS responded slowly when he was attempting flight swapping at about 2 am on AOD, with a response time between 5 to 10 minutes. W24 Lee said that when she started to do flight swaps at about 7 am that day, it took from 20 seconds to 10-15 minutes to carry out a swap. According to her, the response after the reboot at about 11 am was a bit faster, but not significantly. She told the Commission that while the response time varied, the vast majority of inputs, 80-85%, were affected by slow response. There was consistently slow response to the entry of aircraft registration numbers on AOD.

13.53 On the other hand, W35 Cumming of EDS said that he was at PTB throughout the night between 5 and 6 July 1998, and he first noticed slow response at about 6 am. W34 Derrick of Preston claimed that while he was in ACC from 12:30 pm to 6:30 pm on AOD, the response time was typically 3-4 seconds, up to 30-45 seconds in the extreme, and he did not witness any command or operation taking 5, 10 or 15 minutes to execute.

13.54 While it may not be necessary for the Commissioners to definitely accept one of these conflicting versions on the slowness of the system on AOD, they consider that the evidence of the AA operators should be preferred. The response time was not measured by anyone on AOD with a stop watch, and the evidence from the opposing story-tellers must have been based on estimates derived from memory of their feeling on that eventful day. However, the following pieces of evidence, which the Commissioners accept, lend strong support to their finding that FIDS' response time was too slow for normal or reasonable operation on AOD:

(a) EDS accepted in evidence that the system performance was so slow before the reboot sometime after 10 am that it was practically unusable.

(b) Other users of FIDS apart from the ACC operators reported slow response. For instance, at around 8 am and 11 am, it took 20-25 minutes for the FIDS workstation at AOCC to allocate a baggage reclaim belt. This is consistent with the statement of Mr Guy Gerard Summergood of EDS who reported response time of up to 12 minutes from the FIDS workstation in the BCR, and SESL representations that AOCC took over the reclaim assignment from BCR because it was taking too long for the BCR workstation to execute the allocations. Cathay Pacific witnesses gave evidence that the FIDS application on their CUTE workstations was generally very slow throughout AOD and there was logging on problems from around 5 am when Cathay Pacific opened their check-in desks.

(c) Mr Rupert John Edward Wainwright of EDS stated that CPU usage started to increase from about 6 am on AOD although the system was functioning. That would be about the time when users terminal-wide began to use the system intensively under live conditions. He also said that at about 8 am, he began to receive reports from AOCC that FIDS MMI users had problems associated with the Oracle shared memory allocation being too small. The problem slowly increased to peak at around 10 am. Due to the problem and the difficulty in getting the number of users on the system reduced, he recommended shutting down the system to change the shared memory allocation. However, though the system was shut down, the change was not made due to a Unix operating system parameter restriction. After the reboot, Mr Wainwright said that the system performance improved at first but began to slow down again as more users logged back on again. This is consistent with the evidence of W24 Lee and W26 Cheung who both said that the response time improved a little after the reboot but not significantly.

(d) Mr Stefan Paul Bennett of EDS said that while he was at PTB at about 9 am on AOD, there were already shared memory allocation problems. He also confirmed that the CPU usage for AOD was and remained close to 100% and the system performance on Day Two was similar as in the afternoon on AOD. Both W55 Kipper and W56 Shen advised that such high usage would cause performance problems.

13.55 The PTS specifies that operators shall, without exception, get an initial response to their inputs within 0.5 seconds and the final response for 90% of updates shall be received within 2 seconds. This shows beyond doubt that, even if W34 Derrick was entirely right with his estimation of the extent of the slow response, the FIDS performance on AOD was very far off the mark and could not reasonably be said to be acceptable to AA.

13.56 The Commission accepts W55 Kipper's explanations of the technical causes contributing to the slow response in his expert report. Briefly, the following were the major problems which plagued the FIDS system performance on AOD and the few days thereafter:

(a) WDUM - The WDUM process is a core application background process which defines which flight information has to be sent to the FIDS MMI in the workstations to update the displays. This process was identified as having the most serious effect on system performance. There were two problems with the WDUM:

(i) Excessive CPU utilisation. Mr Wainwright of EDS stated that the CPU utilisation on AOD and Day Two was on or near 100%. The system change to solve the problem, Change 109, was carried out in the early morning of 11 July 1998. However, performance issues related to WDUM were identified more than a month before AOD but remained open.

(ii) Deadlock problems. The evidence is that the WDUM process was in deadlock with other user applications in the ACC, AOCC and BCR workstations. Deadlocks caused serious performance problems since they prevented updates and blocked the operators' operation on FIDS workstations. Deadlock problems were identified but had not been resolved before AOD.

Two workarounds were implemented to overcome the WDUM problem: the MMI refresh rate was reduced from 6 seconds to 45 seconds in the early hours of Day Three, and transactions were split to reduce the occurrence of deadlock situations.

(b) Shared pool memory in the Oracle database - This error has been described in detail in the witness statements of Mr Rupert Wainwright (EDS), Ms Susan Wong (AA) and Mr Ian Cheng (Oracle) and summarised by W55 Kipper in his report. The shared pool memory parameters were changed in the early morning of Day Two to enable the system to run faster.

13.57 AA obtained the services of Oracle Systems Hong Kong Ltd ("Oracle Systems") as consultants on Oracle matters, which related to not only the database of AODB and other systems (for which GEC was not responsible), but also the FIDS database. However, Oracle Systems was only contracted to start work in late June 1998. Oracle Systems made a list of recommendations on 3 July 1998, but the recommendations came too late to save AOD and even if carried out in time by AOD, would not have cleared the performance problems with FIDS. Mr Wainwright of EDS said:

> "Had the outstanding Oracle recommendations been implemented between 3 July and 12 July, … I do not consider that performance or stability during this period would have noticeably improved. Primarily this is because none of the outstanding recommendations related to the ORA-04031 SGA issue or deadlocks, locking, WDUM or alerts. Given that these were the issues that affected performance and stability of the system during AOD, I consider that none of the outstanding recommendations from the 3 July 1998 list would have made a significant impact on performance or stability."

13.58 Mr Wainwright's views succinctly bear out the causes that affected performance and stability of FIDS on AOD.

13.59 Oracle Systems personnel were able to help identify the causes on and after AOD, but of course, had AA obtained their services earlier, the problems with the Oracle database of FIDS could have been identified and rectified well before AOD.

13.60 Similarly, had there been sufficient testing of the FIDS software prior to AOD, both the nature and the extent of the above problems would probably have been identified and addressed.

13.61 The root of the problem probably goes back to the tight timing of the programme. The settlement agreement reached between AA and GEC in December 1997, whereby in order to catch up some of the lost time it was agreed that the FAT and SAT would be combined and to be carried out on site, was a dangerous move. In a fax dated 4 December 1997 from EDS to GEC, EDS stated that this posed "a major threat to the confidence in the final system". EDS was apparently not consulted before the conclusion of the settlement agreement.

13.62 No doubt because of the time pressure and the consequent inability to test the software properly before delivery to site, Build 2.0A which was delivered to Hong Kong on 4 December 1997 was not as good as expected. FIDS did not work during the first airport trial on 14

January 1998. Nor did it perform satisfactorily during the second trial on 15 February 1998 or, indeed, even at the third trial on 20 March 1998. The result of the combined FAT and SAT from 23 February to 19 March 1998 was not as good as it might have been hoped. Two further rounds of Re-SAT had to be carried out: the first Re-SAT from 1 to 7 April 1998 and second Re-SAT from 18 to 29 May 1998. Even then the tests were not entirely satisfactory.

13.63 In the end, time ran out and the software had not even reached a sufficiently stable state for proper stress and loading tests before AOD.

13.64 There is overwhelming evidence that had there been proper stress and load tests before AOD, of the actual load on AOD or 120% as opposed to the design load of 200% of the expected load in year 2010, the performance problems on AOD would probably have been identified.

13.65 AA argued that the problems with WDUM had already been identified since early June 1998, and a stress test would do no better. However, the evidence shows that WDUM problems arose merely on a few occasions out of numerous PRs identified in early June 1998. W56 Shen said that if the WDUM problems happened only once or twice, people had more important things than them to deal with. On the other hand, a stress test might have detected the deadlock problems very often, which would immediately raise the priority of attending to these problems. Agreeing with W56 Shen, W55 Kipper further pointed out that a stress test, even of a 100% of the actual load on AOD, would not only identify the WDUM problems, but would have helped identify the reasons for the problems, aiding in their rectification before AOD.

13.66 W45 Mr Kironmoy Chatterjee, the Head of AA's IT Department, also accepted that a stress test would have thrown up the problems haunting FIDS on AOD, in particular the parameters, configuration and WDUM problems. Other AA witnesses such as W24 Lee and W26 Cheung said that a stress test would bring sufficient confidence to them in FIDS and should have been carried out before AOD. Nor did the specialist contractor and subcontractor gainsay the importance of a stress test. W21 Korkowski of EDS told the Commission that slow performance of FIDS would have been revealed if the system was put under stress condition. He emphasised that the only failsafe way of testing a system such as FIDS was to have the whole system tested under stress conditions. His colleague W35 Cumming agreed that stress and load test might have brought out the WDUM problem. W22 Hobhouse of GEC said that even a stress test for one day or half a day would have been better than none at all.

13.67 Much has been said about using the airport trials as "tests" for the FIDS. No doubt, the trials provided some useful input as to the performance and deficiencies of the system. However, the usefulness of the trials as "tests" was limited in the light of the following circumstances:

(a) There was not even one occasion when the entire integrated system was tested as a whole. For example, TMS was not used for optimisation even at the fifth trial on 14 June 1998.

(b) Not all the daily routines had been tested in the trials. In particular, flight swapping was never really tested in live or even "semi-live" conditions in the trials.

(c) Even at the fifth trial, live data was not used. Instead, 114 flights from the AOD schedule were compressed into a 3-hour period for the trial. Without live data, the system could not be tested under real live situations which, after all, was the aim of the trials.

(d) Even after five trials, W26 Cheung, the Manager of Terminal Systems, was not very confident of the FIDS prior to AOD.

13.68 It was because of the lack of time that the stress test was deferred till after AOD. The reason was that the time available before AOD was thought to be better used for resolving the stability problems and ensuring Day One functionality that were of higher concern to AA than the stress test. Assuming there had been sufficient time and proper steps taken to rectify problems identified during the tests, the problems that surfaced on AOD could have been minimised. This again underlines how crucial the slippages in the development of FIDS were to the problems on AOD. The responsibility for this has been discussed in paragraph 13.51 above.

13.69 GEC and EDS as the contractor and subcontractor in the provision of FIDS must be responsible for the inefficiency of the system provided for use on AOD. The Oracle database was part and parcel of FIDS and should also be the responsibility of GEC and EDS. Between the two, EDS as the developer and supplier of FIDS, should take the major part of the blame. As far as Preston (supplier of TMS) is concerned, it is difficult on the evidence to decide whether TMS operated unsatisfactorily or the inefficiency of TMS was caused by slow system response and other problems that affected FIDS as an integral whole. Only a little remedial action was taken on TMS after AOD, as opposed to FIDS as a whole. Therefore, it appears to the Commission to be more probable that TMS would not have had too many problems on AOD if not for the problems of FIDS.

(c) Insufficient training and practice of operators on software functionalities

13.70 Added to the insufficient testing was insufficient training or practice of the software functionalities by the operators. The events on AOD showed beyond peradventure that the training given to the operators was not sufficiently thorough or adequate. However, this has to be distinguished from the allegations of EDS and Preston that the problems encountered on AOD lay more with the operators than the system response. The allegations made by these subcontractors that the problems were external to FIDS are summarised as follows:

(a) the use of TMS by ACC operators was not a designed function, causing problems;

(b) the ACC operators and those of members of the airport community were inexperienced and unfamiliar with how to operate FIDS;

(c) the invalid ETAs sent by CAD to ACC severely impacted TMS functionality; and

(d) the FDDS and AODB interface caused problems to customers of HKT who subscribed for the FDDS service, which problems had nothing to do with FIDS.

13.71 The Commissioners are of the view that the allegation that the use of TMS by AA was not a designed function is but an excuse. The evidence of W23 Lam and W28 Yuen is, and the Commissioners accept, that the optimisation function of TMS was in fact used in the afternoon of 5 July 1998, albeit not for the purpose of stand planning but for the purpose of preparation for the TMS allocations to be made consistent with the SAS allocations, followed by confirmation of the allocations on TMS to be populated to FIDS displays. Input thereafter into TMS was difficult and slow, and the stand information disseminated by TMS/FIDS to the display devices became corrupted, incomplete or inaccurate. The Commissioners are satisfied that the fault must be attributed to TMS or FIDS and nothing else. First, the TMS optimisation was used. Secondly, W21 Korkowski admitted in testimony that input of flight information to alter the results of optimisation on the TMS Gantt chart was within the normal operation design of TMS, and was not an abuse. Since data could not be input or confirmed or could only be done with delay, TMS or FIDS must be faulty. The Commissioners accept, however, that the use of SAS in conjunction with TMS instead of TMS did mean that the energy and time ACC operators were further drained on AOD by the necessary input into TMS, when they were already too busily engaged with the many problems experienced.

13.72 The three representatives of GEC, EDS and Preston who gave evidence before the Commission, namely W22 Hobhouse, W21 Korkowski and W34 Derrick, all agreed that FIDS including TMS was experiencing slow response on AOD, although they denied that the slow response was caused by the bug in the Oracle database. Some work to improve the configuration of the FIDS database was performed in the small hours of 7 July 1998, and some other work to enhance the memory of FIDS was done on 11 July 1998. Anyhow, the slow response of FIDS on AOD occurred, albeit intermittently, about 80% of the time on AOD according to W24 Lee. The Gantt chart on TMS also shut down intermittently through the day. The slow response and the shutdown not only made the operations at ACC difficult to cope with the large number of arriving flights that had to be dealt with on AOD, but also caused doubts to the operators as to the effectiveness and functionality of TMS. It was just natural, so said W24 Lee, that the operators repeated clicking on a function when there was no response, invoked other functions or restarted the computer, thus causing more problems. This should not, in the opinion of the Commissioners, be treated as faults committed by the operators. All the operators in ACC had worked in Kai Tak and those who were supervising them were very experienced. They had also undergone training on FIDS, TMS and SAS. W28 Yuen, for instance, who supervised the operators in ACC, demonstrated his knowledge and proficiency in operating TMS by explaining to the Commission how to effect flight swaps on a TMS Gantt chart most succinctly and clearly. Even W35 Cumming and W34 Derrick accepted that W28 Yuen was proficient with the operation of FIDS. The Commissioners are satisfied that the operators who worked under W28 Yuen and W29 Chan at ACC were not as inefficient or unfamiliar with how to operate TMS as alleged by the FIDS contractor, subcontractor and sub-subcontractor. If they were in doubt, they had W28 Yuen to advise and help them. However, even W28 Yuen experienced difficulty with flight swapping. When Mr C K Chan told him that he could not perform flight swapping with TMS at around 2 am, W28 Yuen tried to help. From the evidence it appears that there were two things that W28 Yuen and his colleagues at ACC did not know:

(a) When an operator entered the chocks-on time and registration number of an aircraft on FIDS MM1, the system would prompt the user on whether it should link the registration number of the arriving flight to a corresponding departing aircraft with the same registration number. W28 Yuen testified that the operators usually clicked “yes” simply to avoid having to manually enter the registration number later on, but were unaware of the causal effect of this, as explained in (b).

(b) There were three methods of linking, which were progressed such that an operator could not return to a method lower in the progression once a higher method had been invoked. The method of linking that operators were familiar with, manual linking, was the second level of linking while linking by registration number was the third level. This meant that after W28 Yuen had invoked linking by registration number with the prompt in (a), this inhibited flight swapping by manual linking that he was going to do later on. Furthermore, he did not know that the solution was to swap the flights by aircraft registration number procedures.

13.73 The cause of this absence of knowledge was that the ACC operators including W28 Yuen and W29 Chan were not trained how to deal with these problems. However, the Commissioners do not accept that this absence of knowledge due to lack of training is evidence of inexperience. This lack of training was the result of the time planned for training being hard compressed by the delays in the development and testing and commissioning of FIDS, and the inadequate communication and coordination within AA and between AA and others. Although the prompt was not even known to W34 Derrick until AOD, the registration linking was described in a document entitled "Description of Flight Linking Functionality (TMS Stand) Initial Draft" dated 23/4/98, which specifically mentioned that it would not be possible to manually link two flights where one or both have progressed to aircraft registration link type. W24 Lee confirmed in testimony that she was shown the document in April 1998 but she did not show it to ACC operators and there was no training given to them on matters contained in it.

13.74 The difficulty with flight swapping affected the operation of TMS/FIDS in ACC on AOD significantly. W28 Yuen said that there was no point for him to confirm stands for aircraft until he finished flight swapping, in order to avoid wasting time and effort to confirm stands for flights which would be affected by the swap. On top of the difficulty with flight swapping, there was slow response of FIDS. While the stand allocation was done manually by the use of placing paper stickers on a whiteboard, the allocated stands would have to be entered into TMS through FIDS MMIs, and that input was seriously affected by the slow response. A large backlog of work began to accumulate when W24 Lee arrived at ACC at about 6:30 am, and she helped with the flight swapping and the confirmation of stand allocations into TMS. The slow response was so bad that the backlog could not be cleared until the night between Day Two and Day Three. This was despite the availability of assistance from W24 Lee since 6:30 am and from W34 Derrick since 12:30 pm on AOD. No one who gave evidence ever suggested these two persons did not know how to do flight swaps or input stands into the FIDS MMI, but the backlog was not cleared until more than 36 hours later. This indicates that the slow response time was very serious.

13.75 The Commissioners are not satisfied that the problems with FIDS on AOD was caused by the inexperience of the AA operators using TMS and the FIDS MMIs, as opposed to their lack of training. Nor are the Commissioners satisfied that the BCR operators employed by SESL were inexperienced. Although Mr Summergood stated that he felt that SESL operators in BCR were not familiar with the operation procedure, that could not be the cause of problems inside that room on AOD. Despite Mr Summergood’s presence and assistance in BCR as early as 8:15 am, the delay experienced by arriving passengers with retrieving their baggage did not quite improve the rest of the day. This leads one to consider why even with the assistance of Mr Summergood, little improvement was achieved. W26 Cheung told the Commissioners she attended BCR at about 8 am in response to a complaint of slow response of the system in the BCR. As a result, AOCC took over the operation from BCR to assign reclaim belts at about 10 am. Even after FIDS was rebooted at 10:45 am, the response time did not improve significantly as Mr Summergood alleged. In fact as Mr Wainwright clarified in his statement, no change was effected to the system at 10:40 am. He aborted the proposed change at 10:45 am. The Commissioners have no hesitation in preferring the evidence of W26 Cheung and Mr Wainwright to Mr Summergood’s.

13.76 W21 Korkowski also alluded to airline operators not being familiar with logging out from FIDS through the CUTE workstations at the check-in counters. He even went to the extent as to say that even if everything in FIDS was working, the users would not have been able to operate the system. The Commissioners find this hard to believe, especially in view of the fact that at least some operators, of AA, SESL and the airlines, must have participated in one or more of the airport trials. Even if some of the operators using FIDS on AOD were new and had not gone through the training or the airport trials, their colleagues who had better knowledge and experience would have been able to help. The experts from EDS and Preston all assisted in the working of FIDS on AOD, but that did not help the operation in any significant degree. There is not sufficient evidence to show that users' unfamiliarity or inexperience contributed towards the problems of FIDS on AOD to a real extent.

13.77 W21 Korkowski admitted in testimony that one aspect of the problems was that when the stand of a flight was confirmed on TMS, that information would not be passed through to the display devices or would be corrupted or incorrect when disseminated through FIDS to other parts of the airport. There was a problem with data generation within FIDS and that was made worse by the slow response of the system. The response time was required by contract to be half a second, and obviously that was not available on AOD. W24 Lee and W27 Ma, both IT Project Managers, described the response time as taking from 5 to 20 minutes. This was totally unacceptable, when the new airport was operating in full swing as from a couple of hours before noon. The slowness simply disabled AA staff from providing prompt dissemination of essential flight information necessary for the users.

13.78 The details of CAD radar track provision of ETAs to ACC can be found in paragraphs 10.18 to 10.20 of Chapter 10. The ETAs from the radar tracker had not been screened before being automatically fed into TMS. W34 Derrick complained that this had a severe impact on the function of TMS. His evidence was that when he arrived at ACC at 12:30 pm on AOD he saw a "sea of green" on the Gantt chart on the monitor. This appears to be consistent with W28 Yuen's evidence that about one half of the Gantt boxes were green. The green bars showed the user that the times entered on the Gantt chart were invalid, as the ETA for a flight was more than 15 minutes earlier than the STA. According to W24 Lee, there were only several flights on the morning of AOD that were affected by these invalid ETAs. Anyhow, the link between CAD and ACC was turned off at 8:30 am, and there could not have been any more invalid ETAs fed into TMS after that time. W34 Derrick was able to clear the green phenomenon at about 2 pm. Whatever effect the invalid ETAs had on TMS would have been cleared off by then. Yet FIDS continued to suffer from slow response time through the rest of the day. The green bars that occurred and remained before 2 pm cannot detract from the fact that FIDS was not performing normally or efficiently.

13.79 There was an allegation made by counsel for EDS in the cross-examination of W27 Ma that the FDDS and AODB interface caused problems to the customers of HKT who subscribed for the FDDS service. Her response was that AA compared the information from AODB to the FDDS internal table within AODB and there were no discrepancies found. AA also looked at the system log, and there was no error message found either. She was then questioned if the AODB database (as distinguished from the database of FIDS) operated slowly on AOD, and she said that there was no such sign. She admitted that she saw FDDS displays frozen in the afternoon of AOD, but after reboot, the display and the information were restored accurately.

13.80 In its response to the Commission dated 8 August 1998, HKT accepted that there were some problems with its servers, resulting in incomplete or incorrect information being displayed on the FDDS monitors installed at its customers' premises, and the customers needed to restart their terminals to get refreshed information. That in the opinion of the Commissioners does not, however, detract from the fact that even if FDDS was operating without fault, the information which it derived from FIDS through AODB was not reliable. If accurate and complete flight information had been available from FIDS, the deficiency of FDDS would only have caused some inconvenience to the customers and not the extent of problems on AOD. The inconvenience could be translated into the necessity of sending a person to obtain the required flight information from the FIDS display devices, which would not drain too much time or resources of the customers. Therefore the deficiency of FDDS cannot reasonably be considered a major problem.

13.81 Returning to the training of the operators, the evidence is that the operators were trained on versions of the software which were under revision and that not all the functionalities were available during training. W42 Mr NG Ki Sing, AA's General Manager of Terminal Operations, told the Commission the effect of the encroachment on training by the lateness of completion of the works. He said that because the systems were not finished when training had to begin, training had to be done on older versions or standalone versions. There were two effects: first, the training was less effective, because the operators might face a situation where what they learned today might not be what they would have to do on AOD; secondly the operators might need retraining on another version, resulting in duplication of time and effort. The following are obvious examples:

(a) The aircraft registration table within FIDS was not available until about 10 days before AOD.

(b) The operators were apparently not aware that they could have populated the table by themselves via the FIDS MMI.

(c) The operators did not know how to properly respond to the prompt that popped up in the FIDS MMI when registration of an arrival aircraft was entered, and even W34 Derrick did not know about this prompt before AOD.

(d) The operators did not know the implications of the progression of methods of flight linking.

13.82 FIDS with TMS was clearly not error free, and even on the first few days of operations W34 Derrick was in the ACC to devise workarounds when problems arose. This shows that TMS was far from "workable" by the operators on AOD or even the first few days. Even Preston in its written response considers that "testing and familiarity compression meant that AOD was arguably 2-3 months too early for systems ... to be completed."

13.83 The Commissioners find that that lack of sufficient training of the operators was also a major contributing factor to the chaos on AOD. The situation improved on Day Two and the days thereafter as the operators no doubt took advantage of the "baptism of fire" and were more familiar with system functionalities and workarounds.

13.84 The inadequacy of training of the operators cannot be blamed on the operators, but rather like most of the problems experienced on AOD was caused by the lack of time which was consequent upon the slippages in the development of FIDS. AA must be primarily responsible for the insufficient training provided to the operators. The inability to make available for training the versions of functionalities to be used on AOD may be the responsibility of AA vis-a-vis GEC, EDS and Preston, but again, the Commissioners will not attempt to apportion such responsibility.

13.85 Before leaving this topic, it is also relevant to mention the problem with the crash of SAS which, according to the contractor City U, was caused by the input of illogical data such as the departure time being earlier than arrival time. The subject was not covered in the test scenarios. Since the Kai Tak system, also developed by City U, was able to handle such illogical data, there would be little reason for the ACC operators to suspect that SAS could not accept them. It would not be difficult to see why the operators were at a loss as to what the problem was when SAS froze and then shut down. This was apparently caused by the lack of coordination or understanding between AA and City U. As to how the responsibility for this should be shared between AA and City U, there is insufficient evidence to enable the Commission to decide.

(d) Lack of or late confirmation of stands

13.86 The Commissioners entertain no doubt that from the point of view of operation, one of the major problems on AOD was the lack of or delay in confirmation of stand allocations. The non-confirmation of the stand allocation meant that the users and operators in the airport would not get the information from the FIDS or FDDS displays. The early availability of accurate stand allocation is extremely important to airport operations. Two causes for the non-confirmation or late confirmation of stands can be identified from the evidence: first, the difficulties experienced by ACC operators with TMS, and second, the practice from Kai Tak of not confirming stands until quite close to touching down or even afterwards.

13.87 It is reasonably clear from the evidence that the problem was linked to the difficulties experienced in ACC with TMS. To begin with, before 2 am on AOD, the stands for the ferry flights, the first arrival flight and the first departure flight on AOD had been confirmed. After Mr C K Chan had performed the pairing of the flight movements received from Cathay Pacific and Dragon Air, problems were experienced in the swapping of some of the Cathay Pacific and Dragon Air ferry flights. It would appear that from that point onwards, TMS could not be operated in any significant way by the operators until W24 Lee arrived at the ACC and began performing flight swapping.

13.88 W24 Lee gave evidence that about the time when she began to carry out the flight swapping, at around 7:30 am, W26 Cheung from the AOCC called her and asked for stand numbers. It was then when she started to confirm stands on the TMS Gantt charts. W24 Lee testified that she would allocate a stand on the TMS Gantt chart according to manual allocation by her colleagues but would confirm only when somebody called her that it was urgent, and she could barely handle it. Even then, not all confirmations successfully passed through although fortunately she knew a workaround to solve this particular problem, ie, by un-confirming and re-confirming again until the confirmation went through.

13.89 W35 Cumming, on the other hand, remembered that there was no stand confirmation until about 9 to 10 am, just before the reboot. W28 Yuen also recalled that confirmations were made at around the same time, but he was not working at the workstations.

13.90 W28 Yuen also gave evidence that even after the reboot, the system would take minutes to confirm a stand. With planes arriving at about every 2 minutes, there was no way that the system could catch up at that sort of confirmation rate.

13.91 W28 Yuen also told the Commission that the ACC's practice on AOD was only to confirm stands after ETA had been received from ATC. W23 Lam confirmed that the practice adopted for ACC operation was only to confirm stands when ETA had been received or the ETA was considered to be accurate and reliable. Thus there was a delay in the confirmation of stands under the practice, exacerbated by the late receipt of ETA. This practice was altered on Day Two to confirming stands an hour before touch down, and the interval lengthened subsequently to two hours before touch down. Anyhow, on AOD, with the radar tracker data through the CAD link the ETAs were supposed to be available about 45 minutes before aircraft landing, but after the CAD link was switched off at around 8:30 am due to the problems with corrupted ETA data, the ACC had to rely on telephone calls from ATC to advise them of ETAs, and from about 1 pm onwards, by fax. Such information only came from ATC about 5-20 minutes before touch down. The ETA would then be passed onto the AOCC by ACC staff who would input the information into the system through the FIDS MMI.

13.92 In the meantime, in the ACC, many calls were received from RHOs, airlines, ATC and AOCC, etc, and the ACC was very busy with lots of phones ringing.

13.93 W28 Yuen further said that by about noon on AOD the apron was full and incoming planes had to queue along the taxiway, waiting to be directed to the first available stand, wherever it might be. W23 Lam's evidence is somewhat different: he said that the apron was full by around 1 pm and there were about 35 stand changes on AOD compared to the normal 10-20 but he agreed that the problem with aircraft queuing for stands on AOD was serious.

13.94 In any event, the situation on the apron must have been chaotic to say the least. In those circumstances, it is not difficult to imagine the tremendous impact and difficulties caused to RHOs and airlines.

13.95 From the evidence, it appears to the Commission that the major cause for the late or absence of confirmation of stands was the unsatisfactory response time of FIDS with TMS, and the practice of late confirmation of stands should also share part of the blame. However, it is difficult to judge how effectively the input of confirmed stands into the FIDS MMI would be or how effectively such confirmed stands would have been disseminated, bearing in mind the slow response time and the other deficiencies of FIDS on AOD. The alteration of the practice after AOD, however, shows that the practice was not a good one, considering the importance of sufficient advance knowledge of stands to operators of the airport community such as RHOs in their serving of aircraft, passengers, baggage and cargo.

13.96 It is not necessary to repeat where the responsibility should lie regarding the inefficiency of FIDS and TMS, which is covered by matters previously discussed in this chapter. AA, and in particular, W23 Lam, who decided to adopt the practice must be responsible for any problem caused by the delayed confirmation of stands as a result of the practice.

(e) Lack of communication and coordination

13.97 On the evidence, there were crucial communication and coordination problems within and amongst the parties which to different extents affected the situation on AOD.

(i) Within AA

13.98 There is considerable evidence of lack of communication and coordination within the AA in the course of the software development.

13.99 First, as far back as April 1997, AMD had already raised their concerns and objections to the delay in the software programme and the compression of the training and trial time. AMD's concerns were not fully taken into account or properly addressed by PD. W42 Ng also told the Commission that AMD was told, rather than consulted, as to the appropriateness of the revised programme. Normally, there were discussions between the two Divisions, but in most cases, the project manager would have the final say as to how the project should be programmed and proceed. When AMD put forward its comments and concerns, some were addressed, but others were not. He gave the examples of the confidence trials and the list of 38 PRs that W26 Cheung produced as AMD’s main concerns about FIDS functionalities, which were not resolved before AOD.

13.100 The general lack of coordination between PD and AMD on many matters was also well documented, both in the ADSCOM documents and in the Booz-Allen Hamilton report, and this aspect is reviewed in Chapter 17.

13.101 Secondly, within the AA, different people apparently had very different ideas of what was supposed to be done on important matters. A telling example is that W26 Cheung thought that (i) stress tests were supposed to be tests of the year 2010 loading of the system and therefore could be postponed; and (ii) confidence trials were supposed to be carried out after AOD. She was, of course, wrong on both counts. Yet, she was the Terminal Systems Manager, and W44 Heed claimed that he relied on her (and W42 Ng, who had no IT background), for deciding whether the FIDS was to be used for AOD operation. Another important aspect of the lack of communication was that W44 Heed did not know that PD and IT Department had agreed with EDS to postpone the stress and load tests because of insufficient time.

13.102 Thirdly, IT Department, principally W24 Lee and W27 Ma realised that it would be important to have EDS support on AOD, the AA management failed to ensure that proper support would be available to those who needed it most or promptly.

13.103 It is clear from the evidence that those who needed support most were the operators in the ACC, not so much because they were not familiar with the systems, but because they had not been trained on using TMS as an input tool and the system, at least according to W23 Lam, W44 Heed and Mr Thomas LAM, Airport Systems and User Support Manager of AA, was not sufficiently stable for use on AOD. Despite this, W34 Derrick was only asked to make himself available from about 6 am on AOD.

13.104 To make matters worse, W34 Derrick could not get the necessary permits to get to the ACC where he was most wanted. W27 Ma claimed that she had liaised with the permits office and was assured that the permit would be ready. In the end, W34 Derrick was not able to get to the ACC until about 12:30 pm. Based on the evidence, if W34 Derrick had been in ACC before 6 am, the situation on AOD would probably have been considerably better.

13.105 On the same subject of providing assistance, a worse aspect was that there was a most damnable mis-coordination between personnel of AMD and IT Department. IT was supposed to assist AMD in the latter's operations. It is understandable that ACC operators did not know that EDS personnel were on stand-by, probably because they had less personal contact with the staff of the contractors. W28 Yuen's evidence is that when he had problems he would contact W24 Lee, but apart from the only occasion at about 3 am when he was able to get her over the phone, he lost contact with her. W24 Lee, however, told the Commission that between 2 am and 6 am, she was checking the displays and CUTE workstations in various parts of PTB where she might not have been able to receive calls. This, if the Commissioners may say so, creates grave doubts as to whether in fact IT was assisting AMD or if there was any coordination at all between the two departments. W44 Heed said that the ACC operators should have called the maintenance help desk which was manned 24 hours, but when W23 Lam reported to him at about 5 am and told him that he (Lam) could not get hold of W24 Lee, it did not occur to W44 Heed to tell W23 Lam to call the maintenance desk either.

13.106 For such an important matter as the use of TMS to populate the stand allocations downstream, the management of the AA ought to have ensured that suitable backup support was available at all times. This AA singularly failed to do.

13.107 Fourthly, although AA did seek advice from Oracle Systems on database issues, such advice was only sought in late June 1998. The WDUM and shared pool problems would probably have been identified if Oracle Systems had been consulted earlier. The Commissioners agree with the comments of W56 Shen that "It was a clear case of too little, too late."

13.108 Fifthly, W26 Cheung who made a contingency plan for passing information to passengers in the event of the failure of FIDS admitted that there was no similar plan made in consultation with RHOs. She also told the Commission that apart from her contingency plan for passengers, there had not been a formal risk assessment on the possible failure of FIDS. All this reflects a communication breakdown between AMD and RHOs, the operators whose services and cooperation were required to save the airport from chaos should FIDS fail. Apparently, according to the contingency plan designed by W26 Cheung, whiteboards were deployed as early as 7 am on AOD at the Departures and Arrivals areas to provide passengers with flight, gate and reclaim belt information. However, whiteboards were established at the Airport Emergency Centre ("AEC") for RHOs only at about 7 pm and not earlier, although the lack of correct flight-related information had manifested at various quarters of the new airport very early on AOD and AA's management had a meeting to discuss the lack of flight information at around 10 am. Whiteboards as a contingency had been included in materials supplied to the airport service providers such as airlines, baggage handlers and RHOs, and they were used, albeit in a limited way, at some of the airport trials. Unfortunately, there was no detailed planning or procedure when whiteboards would be employed, as manifested in their late use at AEC on AOD. It is obvious that there was insufficient coordination between AA and other members of the airport service community on contingency operational procedures in the event of FIDS failure.

13.109 For the lack of communication and coordination within AA itself, it goes without saying that the responsibility lies with the AA management. The person who should take the most blame for the lack of coordination and cooperation between AMD and PD is W3 Townsend. On the other hand, the relevant divisions or departments within AA who failed to communicate and coordinate adequately should be responsible for such failure.

(ii) <u>between AA and other parties</u>

13.110 There are a number of areas in which the Commission finds the communication and coordination between AA and other parties wanting.

13.111 First, the use of the automatic data feed from CAD without screening. Although there was an agreement or understanding between AA and CAD that the flight data from the CAD radar tracker should only be used after authorisation or screening, AA took upon itself to use such data on AOD without any authorisation. All would have been well if no problem had occurred on AOD, or the data were accurate and complete. Anyhow, there was no reason why AA should not have informed CAD that AA was going to use the data without authorisation. Problems arose when some of the ETAs from CAD through the radar tracker were incorrect, creating green bars on the TMS Gantt chart which confounded ACC operators working on the TMS Gantt chart. For this matter, the Commission considers that AA should be responsible.

13.112 Second, the use of SAS rather than TMS as the primary allocation tool. W21 Korkowski's evidence is that EDS was advised by AA of the possibility that TMS might not be used as the stand allocation tool. However, Preston (the subcontractor for TMS) was not informed of the decision made by W23 Lam and W44 Heed of AMD and Mr Thomas Lam of IT in June 1998. Although W34 Derrick of Preston was prepared to limit his criticism of the decision not to use TMS to a minor one, the decision obviously would create more work for the ACC operators. At the very least, EDS and Preston should have been consulted on the risks involved. It is also pertinent to note W24 Lee's evidence that Mr Thomas Lam had asked her to inquire with EDS as to whether it was possible not to use TMS at all, and the response of EDS was no. AA should be responsible for the failure to consult.

13.113 Third, there was a significant failure on the part of GEC to notify AA of EDS' views on the revised programme in December 1997. The evidence before the Commission is that EDS was not advised of the precise terms of the programme and in fact objected to the representation by GEC to AA that it would take about 10 days to revert from the integrated mode to the development of the standalone builds. However, W25 Tsui was only advised of this much later and W43 Oakervee's understanding was that the integrated build could be unraveled within the space of two to three weeks, providing a relatively ready and sufficient contingency. "It came as a very rude shock" to him in February 1998 that the point of no return had passed without his being really conscious of it. It appears that the representation from GEC was a material misrepresentation, which affected the AA's judgment on whether to proceed with the integration mode. For this, GEC should be responsible.

13.114 Fourth, there was a lack of communication or understanding between AA and City U that contributed towards the crashing of SAS, as discussed in 13.85. There is, however, insufficient evidence before the Commission for it to decide how the responsibility should be shared between the two.

(iii) <u>between GEC, EDS and Preston</u>

13.115 There was also a lack of communication and coordination amongst GEC, EDS and Preston.

13.116 Between GEC and EDS: The most glaring communication or coordination deficiency between GEC and EDS must be the failure of GEC to seek EDS' views on the revised programme in the settlement agreement of December 1997, in particular as to whether the system could revert to the standalone builds within a short time. The discrepancy between GEC's representation to AA and EDS's view contributed to the AA management's mistaken belief that AA could always have individual stand-alone builds as a "fall-back" if and when there was any problem in the development and later operation of the integrated build. For this, as said above, GEC should be responsible.

13.117 Between EDS and Preston: There was a “prompt” in the FIDS MMI on which operators were not trained. When this prompt was answered by the operator with “yes”, or as a default, the linking by aircraft registration number would apply between the arriving flight and the departure flight using the same aircraft. However, this would inhibit flight swapping by manual linking procedures later on. Even W34 Derrick of Preston, who provided TMS, did not know about this prompt. It seems obvious to the Commissioners that if a functionality or feature in the FIDS MMI was going to affect operation of TMS, as between EDS and Preston, they would and should have consulted with each other to train operators on the implications and the correct method of usage before the product was put into the hands of the user. The lack of coordination here contributed to the problems faced by the ACC operators in the early hours of AOD. There is, however, insufficient evidence for the Commissioners to reach a conclusion as to the apportionment of blame between EDS and Preston.

13.118 What remain to be mentioned in this chapter are the FIDS display monitors. As 120 monitors were replaced within three weeks after AOD, it is apparent that a majority of the monitors were defective. The cable length and connection problems, which caused 10% or less of the malfunctioning of monitors and LCD boards on AOD are minor causes. FIMI was EDS’ sub-subcontractor providing the monitors, EDS was responsible for their supply and commissioning at PTB, and GEC was the main contractor. As far as AA is concerned, GEC must be responsible for the defective monitors in its position as the main contractor in providing the software and hardware of FIDS, and EDS should be responsible towards GEC. The Commissioners do not feel confident enough on the evidence before them to decide whether FIMI or EDS should be responsible for the malfunctioning monitors. AA should be responsible for the cable problems that resulted in malfunction or inoperation of the monitors and LCD boards, but that only contributed in a minor way to the chaotic situation created by the problems with the FIDS software.

13.119 As far as the public is concerned, AA should be responsible for failing to ensure that the FIDS, software and hardware included, would operate smoothly and efficiently on AOD. Due to the problems with FIDS on AOD, the users of the new airport, the passengers, airlines, ramp service providers and baggage handlers had difficulties obtaining reliable flight related information essential for their operations. This affected them gravely. The Commissioners find that the inefficiency of FIDS and TMS was the main reason for the start of the chaos in the new airport on AOD. For this, AA must be primarily responsible. Its responsibility was to ensure that FIDS, critical to the operation of the new airport, would work as efficiently and smoothly as it (AA) had assured Government. Looking from another angle, AA failed to have sufficient regard to the efficient movement of passengers who were affected by the deficient performance of FIDS, as it is required to do by the Airport Authority Ordinance. GEC is also responsible for not providing an efficient and smooth FIDS, while EDS, the subcontractor of FIDS, is also responsible to the extent that it supplied FIDS. The Commissioners are not able to decide if TMS would have worked efficiently if had not been affected by the problems facing the whole FIDS, or to what extent Preston (the supplier of TMS) should be responsible. AA should also be responsible for not following the agreement that had been reached with CAD in feeding the ETAs into AODB only after authorisation. The corrupted ETAs from CAD caused green bars to affect almost one half of the boxes in the TMS Gantt chart that made input into Gantt chart difficult. Although the link between AODB and the radar tracker was disconnected at 8:30 am, the incorrect and not fully reliable information, as CAD had warned, caused interruptions to the TMS operations up till about 2 pm on AOD. However, these interruptions were relatively moderate and would not have resulted in all the problems encountered with TMS, especially after the ETAs were removed from TMS before 2 pm.

13.120 Despite the insufficient preparation and knowledge that industry practice tests had not been carried out, AA did not make any appropriate assessment of risks or have sufficient contingency planning. SAS was itself a contingency measure, which was planned to be used in the case of failure of TMS. There was also a standby FIDS which would be put into operation if FIDS failed. There was the whiteboard on which necessary flight information would be displayed for various users in case FIDS failed. Whiteboards were to be set up as a contingency measure at Departures Airside Level 6 at the start of the Central Concourse with flight information on departures written on them. Baggage reclaim information was also to be on display on whiteboards set up at the Baggage Reclaim Hall. However, there was little or insufficient planning as to when these various contingency measures were to be put in place in case the primary systems failed. For instance, W24 Lee, W21 Korkowski, W34 Derrick and W35 Cumming were all on standby since the early hours of AOD. Problems with TMS and SAS started to surface at about 2 am, but W24 Lee only attended ACC to assist at about 6:30 am, and the assistance from W34 Derrick and W35 Cumming was not sought by W24 Lee until shortly before that time. Had there been a proper assessment of the risk involved, these people who were most familiar with FIDS should have been asked to standby close to if not inside ACC. W34 Derrick could not even access ACC as soon as he made himself available because there were problems getting a permit for him to access ACC on the airside which took hours to resolve. These deficiencies in planning and risk assessment as well as the instances of failure or lacking in communication and coordination must be the responsibility of AA and it alone.

CHAPTER 14

RESPONSIBILITY – CARGO HANDLING

Section 1 : The Development of the Cargo Terminal Operators at the New Airport

14.1 Different from the situation in Kai Tak where there was only one cargo terminal operator ("CTO") which was Hong Kong Air Cargo Terminals Limited ("HACTL"), there were two CTOs in the new airport, with the additional Asia Airfreights Terminal Ltd. ("AAT"). The cargo handling capacity of AAT and HACTL was eventually to be respectively 420,000 tonnes and 2,600,000 tonnes per annum, giving the new airport a full capacity of about 3 million tonnes a year. However, under AAT's franchise agreement dated 12 January 1996, AAT was to be ready for handling 1,100 tonnes per day in March 1998, whereas under HACTL's franchise agreement dated 18 August 1995, HACTL would have to provide 5,000 tonnes per day, equivalent to about 75% of its throughput capacity on 18 August 1998. HACTL would therefore have 80% of the market share of cargo handling, while AAT the remaining 20%. The actual market share of AAT was even less as AAT was planning to operate at approximately 65% of its total capacity (ie. 280,000 tonnes per annum) and had planned its manpower accordingly. AAT serves about 12 airlines and HACTL serves about 50 in handling cargo.

14.2 AAT is a joint venture company which was incorporated for the purpose of tendering for a franchise to operate an airfreight terminal at the new airport. Its largest shareholders are Singapore Airport Terminal Services Private Ltd and Changi International Airport Services Pte Ltd, and they have between them more than 50 years of experience in the air cargo handling industry. Works commenced in April 1996 to build the terminal on a site of about 40,000 square metres, consisting of the terminal building itself and a service road, parking lots for a minimum of 83 vehicles and 54 trucking docks. The terminal building occupies the best part of the land. The Material Handling System ("MHS") is the key component of the terminal, costing $190 million to design and build. MHS is fully automated and provides storage and retrieval functions for bulk and pre-packed cargo. Within MHS there is a 12-level automated storage and retrieval system with 1,320 storage positions and a 7-level pallet container handling system with 734 storage positions. Other equipment or facilities include equipment transfer vehicles and unit load device ("ULD") equipment, storage racks for small shipments and heavy shipments, tractors and forklifts. There are also 34 workstations for the build-up and breakdown of cargo. Computers are also used extensively for both operations and in the processing of documentation. Occupation permit ("OP") for the terminal was issued on 9 June 1998, later than the contractual date for readiness to handle 1,100 tonnes of cargo per day. However, there were no significant adverse consequences save for some disruption to AAT's on-site training schedules.

14.3 HACTL was incorporated in 1971 with Jardine Pacific Ltd and Swire Pacific Ltd owning respectively 25% and 20% of its shares. HACTL had been operating as the sole CTO in Kai Tak since 1976. There were two terminals in Kai Tak. Terminal 1, which was originally designed to handle up to 350,000 tonnes of cargo per annum, was eventually able to handle 750,000 tonnes with an extension in 1984 and other renovation work in 1998. Terminal 2 was commissioned in 1991, providing an additional throughput capacity of 750,000 tonnes every year. The total capacity was therefore 1,500,000 tonnes per annum, although HACTL was able to handle 1.7 million tonnes in 1997. Community System for Air Cargo ("COSAC"), HACTL's mainframe-based proprietary system, was first introduced in 1976 and it had eversince served the needs of HACTL, its customers and the community very successfully. COSAC was improved in four phases, with the first three implemented at Kai Tak between 1994 and 1998. The final phase included applications that were only applicable to SuperTerminal 1 ("ST1"). W7 Mr Anthony Crowley Charter, the managing director of HACTL, stated that "No other air cargo handler has such a comprehensive and established system or equivalent expertise in systems development." HACTL's service standards at Kai Tak were maintained at an extremely high level with a mishandling rate of merely 1 in 21,000, achieving that through automation from the previous mishandling rate of 1 in 7,000. This record can be better appreciated when compared with a mishandling rate at the point of origin of incoming consignments of 1 in 22. The average dwell times also compared extremely favourably with other air cargo terminals in the world: about 19 hours for exports and 27 hours for imports, and resulted in HACTL achieving an enviable reputation for efficiency and reliability.

14.4 ST1 is designed to handle 2.4 million tonnes of cargo every year. It is a 6-storey building, 290 metres long and 200 metres wide, providing total floor space of 274,000 square metres. The sheer size of the building requires automation to organise it to cope with the scale of the operation. Cargo Handling System ("CHS") that has been installed inside ST1 consists of five levels, which are briefly COSAC 2, Resources Management System ("RMS"), Logistic Control System ("LCS"), Programmable Logic Controller ("PLC") and mechatronics. The details can be found in Chapter 11. The mechatronics comprise Container Storage System ("CSS") and Box Storage System ("BSS"). Two identical parts of CSS are situated at the west and east sides of ST1, and each of the two CSS has six stacker cranes operating within a single aisle, providing full redundancy capability in the unlikely event of stacker crane failure. The stacker cranes operate the full 36-metre height of the building, providing fast and simple container storage and distribution. The two CSS provide more than 3,500 storage positions for containers. BSS is located in the centre of ST1 and divided into North BSS and South BSS. Individual consignments are held prior to build-up in export containers, or after breakdown from import containers. Almost 10,000 storage boxes are provided in the twin BSS rising the full 36-metre height of the building. Each BSS has six aisles, with two stacker cranes serving each aisle allowing for full redundancy capability in the event of stacker crane failure. A total of 24 stacker cranes operated in BSS. CSS and BSS had altogether about 15,000 sensors and reflectors built in for the purpose of processing cargo and safety. The design of CSS and BSS is modular in nature, which means that each portion of the systems is able to work independently so that failure of one portion would have little effect on the capability of the others. The throughput capacity of the main ST1 building is to be 2,400,000 tonnes of cargo per annum. Adjacent to the main building is the Express Centre, which is dedicated to the special handling needs of integrated carriers and express and courier operators, and is designed to handle up to 200,000 tonnes of express cargo a year.

14.5 As with most construction contracts, the development of the buildings of both CTOs was delayed. While the delay regarding AAT's terminal had much less impact, the building construction slippages regarding ST1 were very substantial. An agreement to accelerate the works was entered into between HACTL and its main building contractor, Gammon Paul Y Joint Venture ("GPY") in April 1998. However, this was not able to catch up with all the delays already suffered. The installation, testing and commissioning of CHS inside ST1 were consequentially delayed, and there was much less time for HACTL to train its staff and get them familiar with the new environment in ST1 and in the operation of CHS. AAT was able to obtain an OP for its terminal on 9 June 1998 while HACTL had a temporary occupation permit ("TOP") issued for ST1 on 3 July 1998, just in time for airport opening day ("AOD") on 6 July 1998.

<u>Section 2 : Causes for the Problems on AOD - AAT</u>

14.6 The details of the problems witnessed at AAT and HACTL are set out in Chapter 11. This section will list the alleged causes for the problems and analyse the evidence to find out what the true causes were.

14.7 W4 Mr SEE Seng Wan, the Chief Executive Officer of AAT alleged that the problems encountered by AAT on AOD were mainly caused by the following:

(a) delay in cargo delivery;

(b) lack of co-ordination between AAT and ramp handling operators ("RHOs") and amongst RHOs;

(c) problems in relation to the receipt of flight information through Flight Information Display System ("FIDS") or Flight Data Display System ("FDDS");

(d) effect of shutdown of ST1; and

(e) adequacy or otherwise of dollies.

14.8 W4 See stated that AAT opened on 6 July 1998 with no major technical difficulties with its MHS and computer systems. Although there were some glitches with MHS and the computer systems, they were relatively minor and amounted to little more than teething problems that AAT expected to experience on opening a new facility. The most significant problem was that on AOD and a few days thereafter, an enormous backlog of cargo was built up which led to a heavily congested working environment, both within the terminal and on the ramp interfacing with it. The backlog seriously hampered the processing of daily inbound cargo leading to a snowballing of unprocessed cargo. It was not until arrangements had been made with Airport Freight Forwarding Centre ("AFFC") for transferring the backlog to AFFC for processing from 18 July 1998 that the congestion subsided.

14.9 The problems facing AAT were not serious as compared with those experienced by HACTL. Most of the causes alleged by AAT are similar to some of those raised by HACTL and will be dealt with in the latter part of this chapter. It suffices to state that the Commission considers that the main causes of AAT's difficulties on AOD were the following:

(a) inadequate co-ordination between AAT and RHOs in the hand-over of cargo from RHOs to AAT; and

(b) AAT staff were not too familiar with handling live loads of cargo in the new environment and using new equipment because they did not have adequate training.

14.10 Although AAT alleged that it was in possession of only a few hand-over forms signed and presented by RHOs on AOD and a few days after, during cross-examination of W4 See, RHOs produced over 10 duplicate hand-over forms in their possession, and W4 See was unable to deny that those were signed for receipt by AAT staff. In the Commission's view, the few hand-over forms kept by AAT does not demonstrate that AAT staff only received a few pieces of cargo from RHOs as AAT would try to portray, but rather that AAT staff did not even keep copies of the 10 odd hand-over forms whose duplicates were kept by RHOs. Coupled with this evidence, there was an admission from AAT that the interface between AAT and the ramp was filled with a large backlog of cargo, and that it needed till 13 August 1998 to clear completely with the use of AFFC. There must have been something wrong with the ability of AAT to handle the cargo on the ramp, or else the backlog would not have taken so long to disappear.

14.11 There is also evidence that training of AAT staff was started only immediately after OP for AAT's building was obtained on 9 June 1998, which was less than a month before AOD. The combined effect of these two main causes, in the opinion of the Commissioners, resulted in a huge backlog of cargo building up at the interface between the ramp and AAT's terminal. For its staff's inadequate training and unfamiliarity with the environment and equipment, AAT must be responsible. In respect of the inefficient co-ordination between AAT and RHOs, the Commissioners consider it more probable that AAT staff were too busy with their work inside the AAT building, and that they were not readily available at the interface area to receive cargo from RHOs. RHOs were driving tractors pulling dollies of cargo behind them, and in the hurry-scurry of AOD, if AAT staff were not at the interface area ready to receive cargo straight away, as the Commissioners infer should have been the case, they would simply leave the cargo there. AAT is therefore also found to be responsible on this score, although RHOs should share a small part of the responsibility.

Section 3 : Cause for the Problems on AOD – HACTL

(a) The Alleged Causes

14.12 The finding of causes of the breakdown of ST1 is much more complicated. HACTL mentioned software and hardware problems of its CHS immediately after AOD when it announced embargoes to restrict imports and exports save for perishables and urgent items. However, from the start of the inquiry, HACTL alleged a number of causes which were mostly unrelated to software and hardware problems with its computer systems. It eventually called two experts to attribute the breakdown mainly to causes external to CHS. On the other hand, Dr Ulrich Kipper, an expert for the Commission, also dealt with the causes in his report in great detail which were, more often than not, different from the findings of the HACTL's experts. The Commission will examine the majority of these alleged causes to reach its conclusions.

14.13 On AOD, HACTL's ST1 failed. There were enormous quantities of cargo scattered at the northern part of ST1 and the surrounding areas, and on the next day, HACTL made a public announcement that there was to be an embargo of all inbound cargo. It is therefore undeniable and not denied by HACTL that ST1 was shut down for a considerable period after AOD. The event was variously described as a paralysis, collapse, breakdown or crash of CHS at ST1.

14.14 HACTL stated that ST1 was ready for operation on 3 July 1998 when the TOP for the building was issued. As from that day, outbound cargo were accepted at ST1 for processing before they would be exported on flights using the new airport. By AOD about 2,000 containers had also arrived at ST1 from Kai Tak. These containers had been moved from Kai Tak to ST1 mainly in the night of 5 and 6 July 1998. Some of them were with outbound cargo but most of them were empty. Outbound and inbound cargo were handled on AOD, but eventually an embargo was announced by HACTL at 3 pm on 7 July 1998. HACTL alleged that there were many factors contributing to the collapse of ST1, and the major factors can be summarised as follows:

(a) delays in the completion of construction works resulting in delays in the installation of its machinery, systems and other facilities;

(b) the delays in (a) also resulted in delay in the testing and commissioning of HACTL's machinery and systems and in the training of its staff for operating the machinery and systems;

(c) the late completion of the construction and related works (such as fit-out and decoration works) caused contamination of the environment in ST1 beyond the level expected, especially in relation to the air-borne dust, that affected the operation of the machinery;

(d) the circumstances created by the fact that unlike in the Kai Tak airport where there was only one CTO, i.e., HACTL and one RHO, i.e., Hong Kong Air Terminal Services Ltd. ("HATS"), there were two CTOs, being HACTL and AAT, and three RHOs, namely, Jardine Air Terminal Services Ltd. ("JATS"), Hong Kong Airport Services Ltd. ("HAS") and Ogden Aviation (Hong Kong) Limited ("Ogden"), in the new airport, thus requiring more co-ordination and understanding between the CTOs and RHOs which was not readily forthcoming;

(e) RHOs were not too familiar with the geography of the new airport, the facilities available, and the work required of them, and they did not follow the procedures, in particular the hand-over procedures, agreed to be used at the opening of the new airport, thus causing problems;

(f) dollies at the new airport for carrying cargo between ST1 and aircraft were insufficient; and

(g) FDDS or Flight Display Data Feed Services ("FDDFS") was not providing flight-related information to ST1 as expected or at all, causing trouble or inconvenience in the operation of cargo handling.

14.15 It can be noted that all the alleged causes hardly rest on any fault on the part of HACTL, and if they are established, blame should be attached to other parties. HACTL, however, did mention computer-related causes for the breakdown, e.g., CSS-LCS problems and data mismatch, etc. However, the causes summarised in the preceding paragraph would have the effect of downplaying the causes internal to ST1.

14.16 HACTL retained two experts, namely, W52 Mr Max William Nimmo and W53 Mr Jerome Joseph Jr. Day. These two experts jointly produced a report dated 14 November 1998 and also gave evidence before the Commission. They opined that there was nothing wrong with CHS and that the throughput capacity of the system was available and capable to deal with the cargo load on AOD. There was little evidence in support of this opinion except their stating that they had examined the system and questioned personnel of HACTL who provided answers consistent with their findings. They attributed the breakdown of CHS to various causes which can be divided into external and internal ones, although they were sometimes intertwined. The internal causes were those happening within ST1 and related to the operation of HACTL within ST1, not being caused by any factor outside ST1, whereas the external causes were those not generating from within ST1 that caused or substantially contributed to the breakdown. The causes are summarised below, and whether each is external or internal is included at the end of the item in square brackets:

(a) The absence of information feed from FDDFS. Two alternative ways were employed by HACTL in an attempt to overcome this difficulty: (i) obtaining information from FDDS terminals and (ii) sending staff to the Passenger Terminal Building ("PTB") to read the FIDS display devices and relate the information through mobile radios to HACTL. Both of these methods were useless as the displayed information proved to be either lacking or incorrect. [external cause]

(b) As RMS was not receiving accurate information from FDDS through COSAC or through other means, RMS was unable to provide useful information to LCS, and therefore it was disconnected. [external cause]

(c) Confusion on the part of airlines about how they were supposed to use the customs clearance system of the Customs & Excise Department ("C&ED") resulted in delays in customs clearance notification being received from the C&ED for automatic input into COSAC via HACTL's Air Cargo Clearance System ("ACCS"). [external cause]

(d) Cargo pre-manifests from airlines and shippers arrived late causing time pressure on the operational staff. [external cause]

(e) On AOD, faults occurred in the handling of inventory records at LCS level, and operators were unable to sufficiently keep COSAC's inventory records manually synchronised with LCS records or the actual situation in CSS, resulting in serious inventory mismatches that reduced the overall integrity of the inventory records to an unacceptable level, and consequently slowed the operation of CHS as a whole. [internal cause]

(f) The inventory adulteration was caused by the operators switching from the automatic mode to manual mode of operation of CSS, and they were not familiar with operating in manual mode. The reasons for such a switch were that (i) the equipment was defective; (ii) there were problems arising from live load operations, such as mis-shaped ULDs running over to the side of a roller bed, causing ULDs to jam or causing limit switches to stop transfers, or roller beds mis-aligned causing ULDs to run off to one side, or pieces of polyethylene wrapping drooping down from ULDs and blocking light curtain sensors; and for any of such occurrences, the operator would put the equipment off-line to manually re-position the ULDs; and (iii) faulty or dirty sensors producing incorrect interruptions. [internal cause]

(g) Operators wrongly perceived that CHS was running slowly. This was caused by the operators not knowing clearly how LCS-CSS operated in automatic mode. When an order to move cargo was keyed into a workstation, the required cargo movement would not commence until LCS could schedule a complete end-to-end cargo movement. In order for the movement to start, there had to be no equipment on the movement route off-line or unavailable for LCS to schedule. This means that movement would seldom commence immediately, whilst waiting for a complete transfer route to become available and to be scheduled. However, once the movement began, it would proceed very quickly end-to-end. This "routing" and "reachability" check function of LCS would cause the system to appear to be slow to the operator who would then switch to manual mode. [internal cause]

(h) The congestion at the ramp interface with ST1 impeded the identification of ULDs. The extreme pressure to release cargo dollies adversely affected the manual data entry processes of opening ULD initialisation records in COSAC, in preparation for loading the ULDs into CSS. This data entry process was necessary as it enabled the association of ULD identity information ultimately to consignment information previously received from the airline shortly after the aircraft took off from its foreign departure point. It was also necessary as it would create a computer record of the ULD location in CSS or the terminal. As RHOs did not follow the agreed hand-over procedures, partly caused by the absence of FDDFS and FDDS, it was a very slow and labour intensive process for HACTL's staff to identify ULDs with the flight on which they arrived. The amount of cargo mis-handling on AOD simply overwhelmed the capacity of HACTL's ramp supervisors to keep up with the ever-deteriorating situation. They could not even get RHOs to park dolly trains in a fashion that did not block the removal of other dolly trains that were ready to be moved to CSS airside. Due to the chaos on the ramp, it was also not possible for HACTL's ramp supervisors to reach identified perishable cargo and move it into ST1 for delivery to waiting trucks. [external cause]

(i) Mistakes such as the following, namely, (i) passenger baggage being delivered to HACTL; (ii) airmail being delivered to HACTL; (iii) cargo for ATT being delivered to HACTL and vice versa; (iv) cargo being delivered to HACTL on passenger baggage carts which could not be used for the transfer of ULDs to HACTL's CSS conveyor machinery; and (v) incomplete cargo loads being delivered to HACTL. [external cause]

(j) Errors and omissions in the inventory caused by operators' input necessitated by the manual mode of operation interfered or stopped the operation of LCS in carrying out cargo movement orders. This resulted in more manual mode operations, giving rise to a vicious circle. There was a dire necessity for the inventory to be corrected, and a decision was made to make a manual inventory check in the early hours of 7 July 1998. However, during the process of the inventory check, inventory records were inadvertently deleted due to a human error. As the reason for the deletion was not known at the time, HACTL's management and Control Systems Development Group ("CDG") suspected that there might be some fundamental defect in the computer software, and their confidence in the computer systems was shaken. It was utterly unpredictable how long it would take to locate and solve the problem, and a move back to Kai Tak offered the only realistic hope of recovering the situation. [internal cause]

14.17 To support its case that HACTL should not be criticised for the breakdown of CHS on AOD, HACTL made the following points in their closing submissions to the Commission:

(a) HACTL committed additional funds in the Supplemental Agreement with GPY to accelerate the building works so as to complete the necessary works ahead of the contractual completion date of 18 August 1998.

(b) The "best endeavours" basis had implicit risk involved.

(c) Both Government and AA simply relied on the oral and written assurances given by W7 Charter in May and mid-June 1998 that HACTL would be ready, although knowing full well that HACTL was facing immense pressure to complete ST1 by AOD and that serious delays with the construction work had occurred, which presented a risk of HACTL being not able to complete ST1 on AOD due to the overlapping of construction works, testing and commissioning of HACTL's CHS and training programmes for HACTL's staff.

(d) The delays in the construction works at ST1 had a significant impact on HACTL's state of readiness throughout the construction phase of ST1. In addition, the overlapping of these construction works with the installation of the mechatronic cargo handling machinery also disrupted the commissioning and testing of the entire CHS and also interfered with HACTL's training programmes.

(e) Disruptions to installation, testing and commissioning of CHS and to training of HACTL's staff were caused by:

   (i) Delay in construction works by the GPY, the main contractor in the construction of ST1;

(ii) Failure of YDS Engineering Ltd. ("YDS") to complete its first fix works relating to ducting and electrical trunking;

(iii) Delay in providing permanent power supply by GPY;

(iv) Instability of temporary power supply for commissioning CHS on the west side of ST1;

(v) Five occasions of power interruptions, and three of these due to leaking water and the other two due to poor workmanship by YDS (loose or faulty connections);

(vi) Floor slaps constructed by GPY not up to specifications so that the floors in various areas were not even or level: some floors had to be made even, and sometimes Murata Machinery (HK) Ltd. ("Murata"), the contractor for BSS, had to and did raise the level of the footing of BSS;

(vii) Grinding works required to rectify the uneven floor creating a lot of dust because GPY did not use wet grinding method;

(viii) The constant failure of GPY to keep water out of ST1 as it should, adversely affecting the equipment and the installation of CHS, and resulting in continuous complaints lodged by Mannesmann Dematic AG Systeme ("Demag"), the contractor for CSS, and Murata;

(ix) The overlap in construction and installation works which was a result of Government deciding 6 July 1998 to be AOD and GPY's delays in the construction works. Installation of CHS equipment had to take place before the building was sealed. As construction works were carried on in other parts of the new airport, the equipment was subject to severe contamination problems;

(x) Leaking from the roof of ST1;

(xi) The wet weather in the few months before AOD which damaged the equipment;

(xii) GPY's suspended ceiling contractor, Companion Ltd, delaying its suspended ceiling works, which seriously delayed the completion of the fire services installations for statutory inspections;

(xiii) GPY leaving piles of uncontained sand which spread throughout the floors and onto and into the equipment; and

(xiv) Logistical and practical problems as a result of the large number of workers of various disciplines in ST1.

(g) Flooding by a fire services drencher on 2 July 1998 putting an elevating transfer vehicle and the inner scissor lifts in the Express Centre out of service on AOD, causing a loss of some cargo handling facilities to ST1.

(f) Normal day-to-day operations. Today, CHS at ST1 experienced about 200 equipment interruptions a day, whilst at the same time, performing 60,000 movements, dealing with 4,000 tonnes of cargo. This is roughly comparable to the situation of the CSS at the Kai Tak Airport. The equipment interruptions on AOD were therefore nothing other than normal and do not indicate that CHS was not operational.

(h) HACTL was unable to have AOD deferred as it believed that it was irreversible.

(i) There should have been a "soft opening" for air cargo operations, but that idea had been rejected by AA and CAD.

14.18 W55 Dr Ulrich Kipper, one of the experts for the Commission, classified the causes in a very systematic way. He first assigned the problems identified in the inquiry related to CHS to various problem areas. He then categorised the problems as initial and consequential problems, consequential problems being the effect of initial problems, generally following a sequence of events whereby it can be recognised that the effect of a particular problem was the cause of another problem. He also explained the different meaning between a snowballing and spiralling effects. The phenomenon that one initial problem is causing multiple consequential problems is described as a snowballing effect. A spiralling effect is resulted when the effect of a particular consequential problem is linked with a previous problem, forming a problem chain (feedback loop). Additionally, the resulting effect is increasing with each cycle. According to W55 Kipper, due to the complexity of airport processes, error propagation can be characterised as a combination of spiralling and snowballing effects. In order to ensure a smooth airport operation it is most important to keep the initial problems under control. Once a combination of spiralling and snowballing effects is established, it is an extremely difficult and long-drawn-out process to return to normal operation.

14.19 W55 Kipper identified the following problem areas ("Px"):

(a) P1 : ST1 cargo operations,
(b) P2 : ST1 building and environment,
(c) P3 : CHS software (levels 2 to 5), including commissioning and testing,
(d) P4 : CHS machinery (levels 1 and 2), including commissioning and testing,
(e) P5 : training of HACTL's staff, and
(f) P6 : risk assessment, contingency and system fallback capabilities.

14.20 W55 Kipper's categorisation of the identified problems is as follows:

Caused By	(I) Initial/ (C) Conseq.	Identified Problem	Px
-	I1	CSS “live” ULD irregularities	P1
-	I2	BSS “live” load irregularities	P1
-	I3	Excessive flight delays	P1
-	I4	New C&ED system and procedures (for cargo handling)	P1
-	I5	Dirt on CSS mechatronics	P2
-	I6	Dirt on BSS mechatronics	P2
-	I7	Lack of marked interface area on the ramp on the northern part of ST1 for RHOs’ hand-over of cargo	P2
-	I8	Hostile (ST1) building environment	P2
-	I9	CSS-LCS software bug (errors)	P3
-	I10	BSS-LCS software bug (errors)	P3
-	I11	Electromechanical teething problems	P4
-	I12	New and unfamiliar operating environment (for HACTL and RHO staff)	P5
-	I13	Insufficient training of HACTL's operational and maintenance staff	P5
	I14	Interchange Server (“IS”) as stand-by system	P6

Caused By	(I) Initial/ (C) Conseq.	Identified Problem	Px
		for LCS was not operational on AOD	
I1, I9, I10, I11, I12, I13 C4, C9 ->	C1	Manual operation (of CHS)	P1
I3, I7, C4->	C2	Ramp congestion	P1
C4 ->	C3	Dolly shortage	P1
I1, I2, I4, I5, I6, I8, I9, I10, I11,I12, I13 ,C1,C2, C10, C11->	C4	(Cargo handling) process slowdown	P1
I3, I7, I12, C1, C2 ->	C5	Sloppy ULD hand-over (RHOs – HACTL)	P1
C1 ->	C6	(Negative effect on BSS through) CSS (operational) problems	P1
I12, I13 ,C1 ->	C7	Human fatigue (of HACTL staff)	P1
C4 ->	C8	Inadequate mobile communication support	P2
C1 ->	C9	Inventory mismatch (in CSS/BSS)	P3
C1 ->	C10	CSS-LCS insufficient operator feedback	P3
C1 ->	C11	BSS-LCS: insufficient operator feedback	P3

(b) The Opinions of HACTL's Experts

14.21 If the Commissioners understood the HACTL experts correctly, their opinions were that as CHS was operating without any problem for the last three days prior to AOD, there was no reason why it could not cope with the live load operation on AOD. W53 Day also made calculations based on the work processed at ST1 24 hours from 7 am on 5 July 1998 to 7 am on 6 July 1998 to conclude that the throughput capacity of CHS was sufficient for the purposes of AOD. W52 Nimmo and W53 Day maintained that there was nothing fundamentally wrong with CHS, and what caused difficulty on AOD was that the operators wrongly perceived that LCS-CSS was operating slowly. This perception resulted in the inefficient operation of CHS as LCS-CSS was increasingly operated in manual mode instead of on-line automatic mode. The fact was, according to these two experts, LCS-CSS was not responding slowly but only appeared to the untrained eye to be so. The design of the operation of LCS-CSS in on-line mode was that an order for movement of cargo would only start when the whole route or path of transfer of the cargo was clear. The operators, however, did not understand but as they were subject to heavy pressure of work on AOD they perceived that the operation of LCS-CSS was slow. There were alternative routes and if the quickest one was conceived by LCS as blocked, it would try another one and so on. It was not until all possible paths were conceived to be unavailable that LCS would stop carrying out the movement order. According to the two experts, the designed time for starting movement would be about a few seconds or a few minutes, but sometimes because all the transfer paths were blocked, the function would never be carried out. They opined that if 10% of CSS was used in manual mode, there was a 50/50 chance of LCS starting a transfer order, but if 30% of CSS was in manual mode, LCS would only have 10% chance of starting a transfer order. They said that on AOD nearly 30% of CSS was operated in manual mode. The operation in manual mode caused difficulties in that (i) such operation mode would not be able to provide the throughput capacity that was required on AOD as the automatic mode would; and (ii) it created data errors affecting the inventory kept by COSAC on which LCS operation would need to depend. The data error was either caused by the data entered being incorrect or by the operators forgetting to input the data after executing an order in manual mode. The data concerned included the position of each ULD. When the manual mode of operation became widespread and when the inventory became more corrupted, a physical inventory check became necessary. That took place in the early hours of 7 July 1998. However, shortly after the conclusion of the inventory check, the whole inventory was inadvertently deleted. That sealed the fate of the ST1 breakdown, for it was gravely suspected that there were some unknown causes for the loss of the inventory, involving serious software problems, and thus CHS could not safely continue to operate. The two experts concluded that the breakdown was mainly caused by two factors external to HACTL's systems and equipment, namely, (i) the ramp confusion and the unfamiliarity or non-compliance of the procedures by RHOs; and (ii) the lack of flight information from FDDS, a service provided by Hong Kong Telecom CSL Limited ("HKT") to HACTL as a subscriber.

14.22 There are two intrinsic flaws in the expert opinions of W52 Nimmo and W53 Day. First, they addressed the issues which were not within their professed expertise: for instance, while they said that there was no problem with CHS either in the mechatronics level or with the computer systems, they concluded that the breakdown of CHS was caused mainly by the absence of flight information from FDDS and the chaos at the ramp. However, they did not profess any expertise in FDDS in relation to cargo handling and ramp operations save that both of them said that they had experience and expertise in information systems and management matters. Secondly, both witnesses relied heavily on facts that they were told by HACTL staff but those facts were not supplied to the Commission through documentation or while the HACTL personnel were giving evidence. For instance, it was alleged by the experts that HACTL received only 15 Import Hand-over Forms from RHOs on AOD, based on which they opined that HACTL's staff had difficulties in matching the data relating to cargo imported on AOD that were not covered by those forms with the data in COSAC. HACTL's staff were required to match the consignment details contained in the forms with the data recorded in COSAC so as to handle the cargo for the consignees. The two experts assumed that since HACTL staff told them that they only received 15 such forms, RHOs were at fault in failing to hand-over the other forms covering the rest of the cargo imported for HACTL's handling on AOD. They did not know, until pointed out, that when the RHO representatives gave evidence before the Commission, they testified that their personnel could not find HACTL's staff on the ramp for the hand-over and that this evidence was not challenged. The two expert witnesses also relied heavily on what they had been told by HACTL staff to base their opinion that LCS for both CSS and BSS was functioning. Moreover, they used information provided by HACTL staff to assist them to draw the conclusion that LCS did not experience slow response but only that HACTL operators perceived it to be functioning slowly. It is unfortunate that the two experts relied on information provided by HACTL staff that had not been tested before the Commission. Their independence as perceived and the correctness of their opinions are thus marred.

14.23 Insofar as the two expert witnesses did not profess expertise in cargo handling by the use of FDDS or ramp operation, there is little doubt that their opinion on such matters should be disregarded, as their only legitimate purpose was to advise HACTL on the fields or areas of their expertise and to assist the Commission with their opinions on the same fields and areas. They are not factual witnesses who can offer any evidence on facts in which the Commission was inquiring. The factual inquiry and the determination on what facts are reliable and acceptable are squarely within the purview of the Commission, and no one could legitimately or justifiably usurp the Commission's function in this inquiry. The two witnesses' investigation into the facts with HACTL staff is futile and must be declared to be so, save where such facts are identical to those contained in the evidence received by the Commission. The only safe approach for the two experts is that they should base their opinions and conclusions on the evidence already presented to the Commission. They can rely on parts of the evidence, stating that the evidence is subject to dispute if such being the case as apparent from the testimonies or documents given to the Commission. Since their approach was wrong, it is risky to rely on anything they expressed as their opinions unless it is clearly proved that their views are supported by the evidence presented to the Commission, and that such views are within their fields of expertise.

14.24 The two experts started on the premise that as far as they could see, there was nothing wrong with CHS, and the required cargo handling capacity on AOD was within its throughput capabilities. They based this conclusion on their alleged examination of the system as well as from information provided by HACTL's staff they interviewed. However, they did not even set out any detail as to how they had examined CHS. From thence forward, they started to assign blame for the breakdown of ST1 to external factors, which they concluded to be the lack of complete and correct flight information from FDDS or FDDFS and the ramp chaos experienced outside ST1 on AOD. They reached their conclusions on the basis of the alleged facts supplied by HACTL staff they interviewed without paying sufficient regard to the evidence already before the Commission. Despite the risk involved in relying on their opinions on these so-called external causes because such opinions might have been based on matters not properly before the Commission and because they are not experts on FIDS, FDDS or ramp operations, their views of attributing the causes for the breakdown of ST1 to these alleged external factors should still be examined carefully against reasonableness and the facts as found by the Commission.

14.25 From the evidence of HACTL staff who had given evidence before the Commission and the chronology of events on AOD at ST1 prepared by HACTL, it is clear that the problems experienced with CSS took place very early in the morning. For instance, at 2 am one of the three operational stacker cranes stopped functioning [item AODH 18 of the chronology in Chapter 11]; at 2:20 am about 30 CSS orders were found queuing for being processed due to a LCS error and manual mode operation started [AODH 20,21]; at 4 am build-up staff needed to search for the cargo in loaded stacker boxes at 3/F and 4/F [AODH 23]; at 6 am a lot of units were still waiting at workstations for automatic transfer vehicle ("ATV") pick-up [AODH 24]; at 7:40 am the backlog of cargo had increased [AODH 25]; and at 9 am most of the stacker cranes were being operated in manual mode resulting in further inaccuracies of the inventory [AODH 27]. Due to the slow response of CSS, a large backlog of ULDs had been built up before 7 am.

14.26 The supplemental statement dated 12 December 1998 of Mr Peter LUI Shui Hing, the General Manager Planning of HACTL, shows that at various times on AOD, the following ULDs were received and handled by CHS:

Time on AOD	Number of Import ULDs received from airlines with exact flight identification ("ID") (arrayed by ATA)	Number of Export ULDs accepted onto aircraft with exact flight ID (arrayed by ATD)	Number of ULDs check-in: Import with and without flight ID*	Number of ULDs check-out: Export with and without flight ID, 335 with flight ID
0000	0	0	7	0
0100	0	0	154	0
0200	0	0	123	1
0300	0	0	2	0
0400	0	0	171 720	1
0500	0	0	132	1
0600	45	0	127	7
0700	67	3	4	15
0800	59	18	90	5
0900	79	4	42	20
1000	57	32	28	6
1100	39	11	63	34
1200	48	7	55	27
1300	40	0	101	14

1400	33	4	98	61
1500	25	27	19	21
1600	26	2	80	4
1700	19	1	13	20
1800	27	17	25	12
1900	26	5	27	21
2000	93	21	49	12
2100	37	3	84	23
2200	65	18	42	23
2300	1	9	16	18
Unknown	45	24		
Total	831	206	1,552	346

* This includes some prepacked export ULDs checked in over the landside.

14.27 It is to be noted that the figure of 1,552 ULDs was inclusive of the empty ULDs that had been relocated from Kai Tak to ST1. From midnight up to 7 am on AOD, when there was little received by way of import, 720 ULDs had been checked in. Out of these 720 ULDs, 9 were with exact flight ID whereas the remaining 711 ULDs were with dummy flight ID, ie, without actual flight ID. It is therefore clear that, even accepting these figures from Mr Lui's statement without question, from midnight to 7 am on AOD, a small amount of cargo imported had been received by HACTL. If CHS found any difficulties in checking in ULDs, that had nothing to do with the imports, and therefore had nothing to do with the non-compliance with hand-over procedures of which was alleged by HACTL and its experts to be one of the two major factors causing the problems in ST1. These figures indeed contradict the allegation.

14.28 It is therefore pellucid that the so-called ramp chaos that could only have commenced since the arrival of import cargo could not have caused the slow response of CSS resulting in its operation in manual mode. The amount of import cargo (ie, 45 ULDs in total) arriving before 7 am AOD was negligible. Prior to 7 am that day, the work done by CSS and BSS could only have been in relation to preparing cargo for export, and that CSS had already started to go slow without being bothered by any imported goods. The conclusion that the Commissioners draw from these pieces of evidence is that the ramp confusion and chaos on AOD was caused by, and not causing, the breakdown of CHS. The two HACTL experts' views are not in accordance with the evidence found by the Commission and are illogical. After some cross-examination, even W53 Day agreed that if the ramp chaos occurred only after 7 am, it was a consequence of and not a cause for the breakdown of ST1.

14.29 The second main cause that the two experts opined for the ST1 breakdown was the lack of correct and complete flight information from FDDS. Their view is based on the fact that LCS relied on the flight information so as to prepare the operators for exports and imports. LCS was used to control the operation of the mechatronics of CSS and BSS. The flight information was necessary for RMS to make the necessary planning. The information would convey an order to LCS which would in turn operate CSS and BSS accordingly. The most important flight information for export was the estimated time of departure ("ETD"). Apart from that, the scheduled time of departure ("STD") was always available to HACTL as the STD was from the seasonal schedules from airlines and their Societe Internationale de Telecommunications Aeronautiques ("SITA") system with which COSAC was connected. The STD would not be altered unless there was a 10- to 15-minute difference between it and the ETD. When HACTL had the STD, unless the ETD differed by more than 10 to 15 minutes, the preparation for export would not reasonably be affected in any way. The same applies to the estimated time of arrival ("ETA") and the scheduled time of arrival ("STA"). Similarly, when HACTL had the STA, it would not reasonably have been affected by the absence of ETA. As early as May 1998, AA informed HACTL that the ETA and ETD in FDDS were to be received from Airport Operations Control Centre ("AOCC") and the airlines. If HACTL was truly in need of such flight information from FDDS on AOD, it could and should have contacted AOCC or the relevant airlines for the information. W53 Day did not desist from maintaining that the lack of flight information from FDDS was one of the two main causes for the breakdown of ST1. He said that HACTL would need to know the ETD about five hours before the actual time of departure ("ATD") for export. As for import, HACTL would need to know ETA. However, FDDS supplied neither ETD nor ETA on AOD. Nevertheless, he agreed that there would only be a difference between five hours (time ahead of the ETD when planning for export should normally start) and three hours (when the ETD could be obtained from the FIDS display service for the public), and therefore there was not much difference in time between obtaining the ETA from FDDS or from the monitors displaying ETA through FIDS. Anyhow, RMS, the system that would make the planning, was disconnected from LCS at about 6 pm on AOD, whence the planning function of RMS was no longer used. Regarding imports, if RHOs delivered the cargo to HACTL at the ramp, then the cargo would be there for HACTL to handle, rendering the fact of HACTL having no ETA quite irrelevant on AOD.

14.30 The alleged confusion over the C&ED customs clearance system at the most could only have caused delay in customs clearance. It had nothing to do with the operation of CHS, especially when RMS was disconnected.

14.31 HACTL and its experts alleged that the late delivery of pre-manifests by airlines also caused problems. The force of this allegation is much diluted by another part of Mr Lui's supplemental statement. Mr Lui stated that there were altogether 54 late pre-manifests records on AOD, but those were out of a total of 198 flights, meaning that slightly over 27% of the pre-manifests were late. The impact could not have been that substantial as to become anything near to a major cause of ST1's breakdown. There is evidence that flight departures on AOD were delayed. The inconvenience caused to HACTL by the late delivery of pre-manifests would have been alleviated if the departure time of the flight on which the cargo was put was not delayed. Anyhow, these delays would not have caused any slow response to CHS, which was the main cause for HACTL's operational staff to turn into the manual mode.

It was the switch to manual mode that eventually led to the breakdown of CHS.

14.32 The other alleged external causes mentioned in paragraph 14.16(i) above were, in the opinion of the Commission, minor matters, even if true. They collectively would not have caused difficulties in operating CHS had it been running normally.

14.33 Although the two HACTL experts stated that there was nothing wrong with LCS-CSS and LCS-BSS, yet in cross-examination, W52 Nimmo and W53 Day accepted that there were a number of mechanical problems with CHS. Plenty of examples of mechanical problems can be found in the evidence, such as imperfect calibration of the Geotronic system, insufficient torque provided to the invertor drive on each transfer vehicle, mis-alignment of metal wheels of the right-angle decks, incorrect spacing between the metal wheels at the edges of the conveyor decks and the right-angle decks, and excessive rotation of the metal wheels of the turntable transfer vehicles, etc. Further, they also admitted that there were some problems with LCS-BSS, but they disregarded and did not investigate them because they thought that the most important thing was CSS. CSS had to operate first before the service of BSS would be required. CSS was to store containers or send containers for export or delivery to consignees whereas BSS was for making up cargo into ULDs (containers) in preparation for export, and for breaking up import cargo from ULDs for delivery or storage before delivery. Eventually, they agreed that if BSS could not operate for longer than 24 hours, CHS could not operate.

14.34 It is surprising that the operators were not apprised of the way of operation of LCS-CSS and thought that it was running slowly. W53 Day told the Commission that as far as his investigation with HACTL went, he found that the operators were not sufficiently warned or trained about the way LCS-CSS operated. The two experts also agreed that HACTL staff were not familiar with operation in manual mode, therefore causing a lot of inaccuracies in the inventory. These inaccuracies culminated and finally an inventory overhaul was required. An inventory loss following from it eventually led to the breakdown.

(c) Dust

14.35 Dust had been maintained by HACTL as one of the causes for the breakdown of CHS on AOD. It was first presented as a major problem on 15 July 1998 when the top management of HACTL had a meeting with Government officials led by the Chief Secretary. It was stressed as a major problem by almost all personnel of HACTL who gave evidence before the Commission, save perhaps W7 Charter. A lot of time had been spent at the hearing for this alleged major problem which, when HACTL's two experts were cross-examined, had eventually been conceded to be a manageable problem. HACTL had never withdrawn its allegation that one of the contributing factors for the crash of ST1 on AOD was dust and contamination of CHS. Dust together with the presence of water at ST1 allegedly blocked and seriously affected the 15,000 highly sensitive sensors and reflectors installed for the operation of the mechatronics of CHS. Both CSS and BSS consist of mechatronics. The mechatronics are the mechanical, electrical and electronic equipment that handle cargo. There are conveyor belts and ATVs which move and transfer cargo. The stacker cranes pick up cargo from the conveyor belts and ATVs, putting it into and retrieving it from the storage compartment. W2 Mr K K YEUNG, the Deputy Managing Director of HACTL, emphasised that the mechatronics, being the lowest arm of the 5-level CHS, was the most important element in the handling of cargo. Without them, the whole CHS could not work, while they could work alone even if the higher levels of CHS all failed.

14.36 W11 Mr LEUNG Shi Min gave evidence from Day 17 to Day 19 of the hearing, namely from 7 October 1998 to 9 October 1998, together with W10 Mr HO Yiu Wing. W11 Leung was the Maintenance Manager of CHS of HACTL and admittedly had the responsibility of arranging and supervising the cleaning of CHS, in particular, the sensors and reflectors. He stated in his witness statement which he confirmed on oath that since late April 1998 he had arranged for a team of engineers seconded by the Engineering Department of HACTL to check CHS equipment regularly and to clean the sensors and reflectors thoroughly. As from 18 June 1998, there were up to about 15 engineers from that Department undertaking the cleaning operations for the sensors and reflectors whereas various other parts of the premises were cleaned by a large number of ordinary cleaners.

14.37 W11 Leung's evidence laid great emphasis on the seriousness of dust and contamination. The Commissioners have come to the view that he is wholly unreliable in that regard. The Commissioners observed his demeanour closely during his evidence and he was always most hesitant and not straight forward when being asked questions about dust.

14.38 On Day 17 of the hearing, W11 Leung testified that at about noontime on 6 July 1998, ie, AOD, four engineers told him that the mechatronics of CHS that stopped operation could be restored by wiping the sensors and reflectors, and that experience tallied with his own when he helped to rectify problems that morning. He immediately told W20 Mr Tony KWAN To Wah, the General Manager of the Engineering Department of HACTL, about the dust problem, and W20 Kwan asked him to look further into it.

14.39 On Day 18 of the hearing, without being questioned, W11 Leung volunteered that he had made a mistake regarding what he had told the inquiry the day before, in that he did not on AOD tell W20 Kwan about the dust problem, but only about the interruptions to the operation of the mechatronics of CHS, without mentioning dust as the cause. He merely suspected that the cause was dust although he had been told by four of his engineers that the problem was with dust.

14.40 On Day 17 of the hearing, W11 Leung stated that dust, according to his reckoning, caused about 30% of the problems experienced at ST1 on AOD. On Day 18 of the hearing, he produced some tables setting out figures that purported to show that CHS equipment was affected by dust, and he estimated it to be responsible for 30% of the problems on AOD. In fact, the estimate was only his guessing without any contemporaneous document in support. According to the proper reading of those tables, about 50% of the problems encountered at ST1 on 6 and 7 July 1998 were caused by dust. Yet he maintained that he only suspected the problems was caused by dust, and did not tell anyone more senior than him in the HACTL hierarchy on 6 or 7 July 1998 about his alleged suspicion.

14.41 W11 Leung's difficulties in explaining as to whom he had informed the alleged cause of dust and if so when, should be viewed in the light of the evidence that was recorded in contemporaneous documents which are outlined as follows:

(a) By a press release of 7 July 1998, W7 Charter, the managing director of HACTL, when announcing a 24-hour embargo on, inter alia, imports on all passenger flights other than perishables, told the media that HACTL had "encountered computer system difficulties" and that it had "to buy time to rectify these system problems";

(b) On 8 July 1998, in another press release, W7 Charter extended the embargo for 48 hours so as to allow HACTL's "engineers and contractors adequate time to rectify current hardware and software problems with BSS";

(c) In a press release of 9 July 1998, W7 Charter announced a moratorium till 18 July 1998 on all cargo on all aircraft, save urgent items, and mentioned that the moratorium would "assist the company in rectifying software and mechanical problems";

(d) On 10 July 1998, W7 Charter held a press conference at the Conrad Hotel, in which he again mentioned that the moratorium till 18 July 1998 would enable HACTL to "address and deal with software and minor electrical and mechanical equipment problems"; and

(e) In the "faults summaries" compiled by the Engineering Department covering 5 to 7 July 1998, there was little mention of dust.

14.42 W10 Ho, who gave evidence together with W11 Leung, faced similar difficulties as W11 Leung. On 21 September, W10 Ho made a witness statement to the Commission stating that "On AOD, the engineers reported to management that the majority of the equipment faults were caused by dust and other debris on the surfaces of the sensory equipment." When W10 Ho gave evidence on Day 18, 8 October 1998, he amended that statement to read "Immediately after AOD…" Despite the amendment, it does not alter the fact that dust was a problem. However W7 Charter in his evidence said that top management of HACTL was only aware of dust being the cause of CHS breakdown between 10 to 15 July 1998. The Commissioners do not accept the evidence of W11 Leung and W10 Ho that on AOD or immediately thereafter the engineers reported to them problems with dust as the cause of the breakdown of CHS. There was no public statement by W7 Charter or anyone of HACTL about dust or contamination being the cause of the problems at ST1 until 15 July 1998 when HACTL's top management met with the Chief Secretary and other Government officials. The stress in all the press releases thitherto was on software and system problems and nothing on dust.

14.43 The trouble created by dust and contamination was appreciated by W2 Yeung, as early as 21 April 1998, as evidenced by the minutes of a meeting held on that date. W2 Yeung directed W20 Kwan to deploy people to deal with dust and contamination. W11 Leung was the person who was entrusted by W20 Kwan with the task. W11 Leung told the Commission that he had arranged many cleaners to clean various parts of ST1 and deployed 15 engineers to deal with the cleaning of the mechatronics equipment, especially the sensors and reflectors. Realising that dust caused problems to the operation of the equipment on AOD, W11 Leung sought the assistance of the engineers on day shift, in addition to his 15 engineers, to deal with dust. If he had mentioned the dust problem to W20 Kwan at about noon on AOD, it would have been extremely unlikely that W20 Kwan would not have reported it to W7 Charter or W2 Yeung, and it would have been impossible for W7 Charter to have failed to mention openly to the media in the period between 7 and 10 July 1998 that dust was the main culprit for the ST1 crash.

14.44 The various versions of the evidence of different witnesses from HACTL simply do not tally. The Commissioners do not believe that dust did cause the amount of problems facing ST1 on AOD as alleged. Dust might have caused some problems, but those could have been rectified easily by engineers wiping the sensors or reflectors.

During cross-examination, W7 Charter stated that the problem of dust was overplayed. The statement would be puzzling if in fact dust was responsible for 30% or 50% of the problems encountered by ST1 on AOD.

14.45 Further, if dust did cause any problem, the Engineering Department or W11 Leung that allowed the problem to persist till AOD would be guilty of failure of duty on their part. The excuse that the severity of the dust problem could not have been foreseen prior to AOD, put forward by both W2 Yeung and W11 Leung, is unreasonable and not accepted by the Commission. W9 Mr Gernot Werner, the Senior Project Manager of Demag, the supplier of CSS, described that dust was always present in ST1. He said that dust was inside ST1 during the months when testing and commissioning of CSS were carried out, as it was present on AOD and for a long period thereafter. If in fact dust was the culprit on AOD and it was noticed by at least W11 Leung and four engineers, it would be inconceivable why the faults summaries on AOD and 7 July 1998 hardly identified it. The faults summaries reported problems by CHS and were prepared by the Engineering Department a week or two afterwards. On AOD W11 Leung and no less than 15 engineers were assigned the task to deal with dust, and he should have known as early as noon on AOD that, at least according to the report from four of his engineers if not through his own experience, that dust did cause at least part of the problems on AOD. If the crash of ST1 was caused by software or hardware deficiency, the responsibility would rest squarely with HACTL, but if the cause was dust as alleged, the fault should, as must be realised by HACTL, lie on somebody or somewhere else. While it is appreciated that there must be a lot of confusion to the extent of a general panic on AOD at ST1, it would be most unlikely that the culprit of dust, if at all it was a fact, could have escaped the attention of all the persons in HACTL's middle and top management.

14.46 According to W9 Werner, he met with W20 Kwan of HACTL on 8 July 1998, when he was told that the problems encountered were data mismatch and file corruption, and that they were mainly high level software related. W9 Werner carried on to say that on 13 July 1998, he had a meeting with HACTL's management when it was mentioned to him that there were software related problems within

HACTL's computer systems and network problems and the problems were under current investigation. On 14 July 1998, W9 Werner put forward a proposal to HACTL to develop an off-line mode based on the operations of PLC and the mechatronics so as to enable CSS to operate only levels 1 and 2 of CHS, cutting the link of PLC to LCS that would have enabled CSS to be operated in an automatic or on-line mode. His proposal was accepted and as a result, W9 Werner and his colleagues made necessary modifications to some 100 PLCs, and assisted in the training of HACTL's staff on how to use the off-line mode. The off-line mode was ready and started operation on 18 July 1998. During these meetings that W9 Werner had with HACTL, HACTL never mentioned any problem with dust. When W9 Werner proposed to modify PLC in order to enable operation of CSS on off-line mode, no one in HACTL suggested that the proposal would not work since whatever modification was done to CSS, its operation would similarly be hampered by dust. In fact this off-line mode worked and experienced little problem with dust.

14.47 The Commission accepts W9 Werner's evidence cited above, not only because it was not challenged by HACTL's counsel in cross-examination that the off-line mode of CSS operation was in fact effected on 18 July 1998, but also that if dust was the source of all evils, W9 Werner's proposal should have been rejected by HACTL as futile, or at least he would have been warned that whatever Demag did, that would still be subject to the colossal problem of dust. It might be argued that W9 Werner testified from the motive of saving Demag and tried to shift the responsibility for the paralysis of ST1 to HACTL, by telling the Commission that HACTL had problems with its own software or network. However, even if W9 Werner were to tell the Commission that dust was mentioned by HACTL to him as the culprit, it would not have adversely affected Demag's interest either: Demag could never be accused to be the creator of dust. Even though HACTL had cleaned the whole of CHS, in particular all the sensors and reflectors between 8 and 13 July 1998 after having removed all the cargo from both BSS and CSS, there would have been no conceivable reason for it to have accepted W9 Werner's proposal to cut the link between PLC and LCS had there been no inherent problem with LCS or any part of the computer system on higher levels of CHS.

14.48 On Days 21 and 22 of the hearing, ie, 13 October 1998 and

15 October 1998, W16 Mr Hiroshi NAKAMURA, W17 Mr Tomonobu SAEKI and W18 Mr Shin YAMASHITA gave evidence in group. They were respectively the Project Manager, Project Engineer and Testing and Commissioning Manager of Murata, the supplier and installer of BSS, the other main mechatronics component of CHS apart from CSS. These three witnesses were at ST1 during the installation, testing, commissioning and maintenance of BSS. They were all working at ST1 in July and August 1998. They told the Commission that there were three problems that affected the operation of BSS on AOD, namely, dust, mechatronics and LCS. They also explained that the slow response of BSS was one and the same problem as that caused by LCS. On AOD, they personally had knowledge of three to four occasions when interruption to BSS was caused by dust. W16 Nakamura described by means of a pie chart his impression of the proportion of each of the three problems that contributed to the troubled working of BSS on AOD. The pie chart showed that dust represented about 2%, mechatronics about 2% and LCS covered the rest of the pie. W17 Saeki said that his impression was the same as W16 Nakamura's, while W18 Yamashita drew another pie chart showing that dust occupied about 6%, mechatronics about 5%, with the large remaining portion attributed to LCS. W16 Nakamura told the Commission and the two other witnesses agreed that the dust situation was worse in the period between 1 and 5 July 1998 than that between 6 and 9 July 1998, while it was less serious in the period from 10 July to 3 August 1998.

14.49 W18 Yamashita testified that HACTL gave three instructions dated respectively 16, 18 and 21 July 1998 to Murata for modification works to be done by Murata to the interface between LCS and PLC regarding BSS. Such works were carried out accordingly and followed by site tests and operation user training, resulting in the full operation of BSS since 13 August 1998. Without these works, which were performed at the request of and had to be paid by HACTL, BSS could not be operated smoothly. Few of these works were required by reason of dust.

14.50 There were delays in the construction of ST1 and the adjoining Express Centre, with consequent delays in the installation of various facilities and fit-out works. The installation, testing and commissioning of the systems, including the 5-level CHS, and the training of personnel in the operation of CHS were likewise delayed. The TOP for ST1 was only granted on 3 July 1998 and the OP for the Express Centre was issued slightly earlier on 27 June 1998. There was little doubt that the construction and touch-up works did result in a lot of dust pervading the air on AOD and thereafter. However, all those concerned with CHS, namely, HACTL, Demag and Murata, knew full well at the latest from late April 1998 that dust affected the testing and commissioning of CHS and, unless controlled, would continue to affect the CHS functions when it was put into actual operation. Each of them endeavoured to ensure that the environment would be sufficiently clean for CHS to work. While the sensors and reflectors installed by Demag were designed with protection from dust invasion, those provided by Murata that had been badly affected by dust were duly replaced during the stage of testing and commissioning. If the sensors and reflectors were not replaced by Murata, the mechatronics of both CSS and BSS would not have been treated by all concerned as fully prepared, perhaps subject to some fine-tuning, for operation on AOD. The Commissioners accept that there were a few interruptions to CSS and BSS caused by dust on AOD, but these were insignificant, because the joint efforts of HACTL's engineers under the direction of W11 Leung and the personnel of both Demag and Murata had worked to reduce this environmental impact to a negligible level. Even HACTL accepted that dust did not cause any problem on AOD or thereafter in the cargo handling by the Express Centre that was situated next to ST1, although the explanation proffered was that there were few sensors and reflectors in the cargo handling equipment of the Express Centre. The Commissioners come to the view that dust at ST1 on AOD was but a minor problem on any reasonable reckoning, and was overplayed by all the witnesses from HACTL, as its Managing Director W7 Charter himself conceded.

(d) <u>The Main Causes</u>

14.51 As said before, nothing in the major causes alleged by HACTL and its experts seems to attach blame to HACTL. There was a notable silence on the operation of ST1's CHS save regarding the functioning of CSS and BSS. The only admissions made by HACTL regarding the failure of CHS to handle cargo efficiently on AOD were that there was a slow or perceived slow response of the system and there were some minor problems with LCS.

14.52 LCS is level 3 of CHS which gives orders to PLC for operating and controlling the mechatronics. LCS applies to both CSS and BSS. HACTL's witnesses who gave statements to the Commission and testified at the hearing all stated that there were many contributing factors to the paralysis of ST1 on AOD. Although all the alleged causes set out in various paragraphs above were described as problems and contributing factors, none was freely admitted by HACTL to be the main cause or the major problem. It can be noted that the responsibility for all of the alleged causes was attributed to rest with other parties, and, if correct, HACTL will seem to be free from blame.

14.53 When the group of four witnesses, W12 Mr Johnnie WONG Tai Wah, W13 Peter PANG Tai Hing, W14 Ms Violet CHAN Man Har and W15 Mr Daniel LAM Yuen Hi, all from HACTL, were cross-examined by Mr Benjamin YU, Counsel for the Commission, W15 Lam said that he was responsible for doing all the on-site integration testing for CSS and BSS. He was to report the test results to his superior officers W13 Pang and W12 Wong. As he did not find anything in the testing that caused him any concern regarding the operation of CSS or BSS, he so reported to his two superiors.

14.54 W15 Lam testified that he had tested the throughput of CSS but did not carry out any testing on the throughput of BSS. The testing of the throughput would be for seeing how many units of cargo could be handled by CSS and BSS in an hour. The result of his throughput test with CSS was that CSS could handle 30 containers each zone in an hour. However, he did not carry out any throughput test with BSS, as that would have exhausted his manpower. He told the Commission that he would have to use over 700 boxes or bins to test a zone of BSS, which according to the user specifications would be required to move that number of boxes or bins within an hour. He merely relied on the test that had been conducted by Murata with the result that a zone of BSS was able to move 720 boxes or bins in an hour. He explained that as HACTL's Terminal 1 at the Kai Tak Airport was using a similar BSS, it would be superfluous and unnecessary to test its throughput. Yet

Murata's tests were relating to the working of BSS on levels 1 and 2, namely, the mechatronics and PLC of the system, whereas W15 Lam should have tested BSS as integrated with the higher levels, namely, LCS, the RMS and COSAC 2. HACTL's case is that COSAC 2 was an enhancement of COSAC 1 used in Kai Tak, the RMS was a new development for ST1 and LCS was a new version of that used in Kai Tak. As all the softwares had been used in Kai Tak, integrated tests conducted by HACTL were not necessary. However, Murata's tests did not include the three higher levels of CHS, and without any test on BSS as integrated with these higher levels, W15 Lam could not have any sound basis to be sure that BSS as so integrated would be able to perform the throughput as expected when it was put into full operation on AOD and thereafter. Moreover, the results of the on-site integration tests were reported by W15 Lam to his two superiors, W12 Wong and W13 Pang, but neither of them made any checking, purely relying on the reported results from W15 Lam. While W15 Lam thought it was superfluous for him to conduct any throughput integrated test for BSS, his superiors did not notice it. In actual fact, no witness from HACTL has told the Commission that any integrated test on the throughput of BSS was ever done before AOD. The Commissioners find that this was one of the major reasons why on AOD, when there were many cargo for ST1 to handle, BSS experienced a slow response.

14.55 In fact, one of the causes alleged by HACTL and accepted by the Commission for the paralysis of ST1 on AOD and the few days that following was the loss of inventory in CSS. Apart from some stacker crane stoppages, CSS also experienced slow response, and so much so that the staff manning the system switched to manual mode, or operation of the system without relying on LCS. The normal procedure for operation in manual mode would require the staff to enter into LCS the particulars relating to the item of cargo manually dealt with, so that the base inventory would be updated. If data were not entered, LCS would lose track of the item and its whereabouts. If CSS operated in automatic mode, it would need to rely on the inventory being complete and correct. For instance, if an item had by manual mode been put into a storage compartment and LCS was not informed about it, LCS might in automatic mode send a cargo to that compartment for storage, which could not be done. When the operators who had used the manual mode to handle cargo either made an error in the required data they entered into LCS or forgot to enter the data into LCS, the base inventory would be adulterated with mistakes, resulting in a return to the operation of CSS in automatic mode impossible.

14.56 The significance of having a throughput test for BSS was overlooked by all those responsible for ensuring that the system was properly and sufficiently tested before AOD. This tallies with what was stated in the press release made by HACTL on 8 July 1998, when the embargo mainly on import cargo was announced to be extended further, as follows:

> "Since our announcement yesterday of temporary measures to relieve SuperTerminal 1 from the pressures it was under, we have now had time to more closely analyse problems …
>
> "… allowing our engineers and contractors adequate time to rectify current hardware and software problems with our Box Cargo Storage Systems."

14.57 The Commissioners therefore conclude that one of the major causes for the breakdown of ST1 was that CHS, especially integration of BSS with the higher levels, was not sufficiently tested before AOD, which was a result of the compression of the time required for testing and commissioning of such sophisticated and complex CHS. This is also the view of W55 Kipper and W56 Professor Vincent Yun SHEN, the experts appointed by the Commission.

14.58 Another main cause was identified by W52 Nimmo and W53 Day, HACTL's experts. They stated that the operators working on the floor of ST1 were not well trained or familiar with operating CSS or BSS in manual mode, which was supposed only to be used temporarily. That was the reason why there were so much operators' errors in data entry into CHS that corrupted the inventory database. This is further borne out by the fact that Demag had to assist in the training of HACTL's operation and maintenance staff on how to use the off-line mode after AOD. The experts' theory of perceived slowness compelled them also to accept that the operators were not well trained or familiar with the working of LCS-CSS and LCS-BSS, because if the theory was correct, the fact that LCS would not normally commence the process of a cargo movement order until the entire route was clear must have been unbeknown to the operators. Although the Commissioners do not accept the theory, the admission of insufficient training and unfamiliarity with the equipment and machinery may have certain truth in it. The delay of the construction works must have similarly resulted in lesser and untimely training of the operation staff as it had compressed the time required for the proper testing and commissioning of the systems.

14.59 HACTL generally maintained its reticence about what had been done with CHS by way of rectification after its breakdown on AOD. This has caused great difficulty to the Commission in identifying what was precisely wrong with CHS. The evidence of W9 Werner, the Senior Project Manager of Demag which supplied CSS to ST1, is that his proposal made on 14 July 1998 to develop an off-line mode based on the operations of PLC and the mechatronics so as to enable CSS to operate on levels 1 and 2 only was accepted by HACTL. The proposal had the effect of cutting the link between PLC and LCS that would have enabled CSS to operate in on-line automatic mode. As a result, Demag made modifications to some 100 PLCs, and assisted in the training of HACTL's staff on how to use the off-line mode, which was started on 18 July 1998. W18 Yamashita of Murata, the supplier of BSS, also testified that HACTL gave instructions to Murata from 16 to 21 July 1998 for works to be done by Murata to the interface between LCS and PLC of BSS, resulting in the full operation of BSS as from 13 August 1998. It can be reasonably inferred that there was something wrong with the interface. The Commissioners find more probable than not that one of the main causes for ST1's paralysis was that there was something wrong either with the software of LCS or with the interfaces between LCS and CSS and between LCS and BSS.

14.60 During the course of the evidence of W7 Charter, he hinted that HACTL had been operating under pressure to make ST1 ready for handling cargo on AOD, which was decided by Government without consulting it and despite the contractual completion date of 18 August 1998. This could be viewed in two stages: before AOD was decided and thereafter. Airport Authority ("AA") and all contractors employed by

AA had been operating under the belief that the target date for opening the new airport for operation was April 1998. Due to the delay in the construction works in putting up ST1, AA eventually in December 1997 came to the view that the new airport was ready to open in the last week of April instead of on 1 April 1998. This conclusion can be found in a letter dated 10 December 1997 from W50 WONG Po Yan, the Chairman of the AA Board, to the Chief Secretary. However, HACTL was not informed of this conclusion. Airport Development Steering Committee ("ADSCOM") on the other hand took into consideration mainly the delays in the ST1 construction works and in the provision of FIDS and Mass Transit Railway Corporation ("MTRC")'s insistence that the Airport Railway ("AR"), which was later known as the Airport Express, would only be ready on 21 June 1998 to reach a decision that AOD should be in July 1998. When this decision was announced on 13 January 1998, HACTL was, according to W7 Charter and W2 Yeung, relieved and happy because HACTL would have three further months, from 1 April 1998, the original target date to 6 July 1998, the announced AOD, to make itself ready. The pressure under which HACTL was operating before 13 January 1998 must have been relieved.

14.61 After the announcement of AOD, HACTL should not have been subject to any pressure to make ST1 ready for operation on AOD. This is obvious from the fact that HACTL volunteered that it would be able to process a throughput of 75% on AOD in place of its previously promised throughput of 50% by April 1998. W7 Charter also said in evidence that HACTL did not know that if it was not ready on 6 July 1998, AOD could be deferred; this might be treated as a hint that HACTL was again operating under pressure to be ready by AOD and would not make any suggestion for the date being deferred. However, this feeling of pressure was inconsistent with the assurances given by HACTL continuously right up to the beginning of July 1998 that ST1 would be ready for operation on AOD. There was correspondence whereby HACTL was urging the Fire Services Department and the Buildings Department to grant fire safety certificates and occupation permit. Obviously HACTL was eager to obtain these permits, but this eagerness could hardly be properly translated into HACTL operating under undue pressure.

14.62 HACTL also mentioned in evidence that it thought that the 6 July 1998 was not moveable. It also raised the idea of a soft opening, meaning to use Kai Tak and the new airport at the same time even after AOD. The idea of a soft opening was suggested by HACTL at the stage even before the franchise agreement was reached. By a letter dated 16 August 1995, two days before the agreement was initialed, the then Financial Secretary wrote to the Chairman of HACTL,

> "You raised the issue of HACTL operating with partial capacity at Chek Lap Kok (CLK) and a portion of its operations at Kai Tak. The Authority is firmly committed to the new airport opening in April 1998. Although HACTL will only be contractually bound to a 36 months programme, we expect HACTL to improve on it in practice with a view to achieving a facility capable of handling a minimum of 1.2 million tonnes per annum on airport opening. …
>
> "I can also confirm that in the event that temporary trucking operations (for also using Kai Tak after AOD) … were required (and we hope that this would never be required), the cost of such operations would be taken into account in any future scheme of control arrangements."

14.63 As it eventually transpired, the new airport opening in April 1998 to which "the Authority is firmly committed" was altered to 6 July 1998. It would be unreasonable for HACTL to hold the belief that AOD could never be deferred. HACTL's position is that it was reasonable for it to be confident in the ability of CHS to successfully handle the cargo presented to it on AOD. Had HACTL been less confident with the readiness of ST1 on AOD and requested either for its postponement or a soft opening, and put hard facts in support before Government, it would have been unrealistic of ADSCOM not to accede to one of these alternatives. Indeed, after the notice of 25 March 1998 to quit Kai Tak by 5 July 1998 had been served on HACTL, HACTL was advised by a Lands Department letter dated 5 June 1998 to write if it had any difficulties in vacating those premises on 5 July 1998. However, HACTL did not take up the matter further. When ST1 was paralysed, Government and AA never failed to help HACTL in its arrangements to handle cargo together in ST1 and Terminal 2. The Commissioners are of the view that it was not so much HACTL's belief that AOD could not be deferred or that soft opening was absolutely unavailable that was the root of the problem. Rather, it was HACTL's over confidence with its brainchild, ie the computer systems of CHS and with its ability to have ST1 ready by AOD that resulted in the chaos in ST1. Everyone was doubtlessly working under a certain amount of pressure to pull all available resources together in order to minimise slippages and to ensure that the new airport would be fully operational on AOD. Government was trying to impress upon all concerned to work towards a common target and to maintain the necessary momentum, but it would be against logic and reason to imagine that Government would continue to insist if it had been shown that the goal was impossible.

Section 4 : Responsibility

14.64 The responsibility for the problems of AAT should mainly lie with AAT, although RHOs should also be responsible in a minor way. AAT must be responsible for its staff who were not too familiar with the new environment and the working of the new system installed in the terminal. AAT should be responsible for not giving them sufficient training and providing them with on-site familiarisation. On the other hand, while AAT must be responsible for the deficient co-ordination in the hand-over of cargo on the ramp, RHOs should also share a small portion of responsibility.

14.65 As to the causes for the paralysis of ST1 on AOD, the responsible parties that can be identified by the Commissioners as to who should be responsible are set out in the following paragraphs.

14.66 There are two identified parties who could be responsible for the delay in the completion of the construction works resulting in delay in the installation of other facilities and ST1's machinery and systems, ie, HACTL or GPY. Murata and Demag are not responsible because HACTL did not maintain any allegation against either Murata, the supplier of BSS, or Demag, the supplier of CSS, despite the fact that the installation, testing and commissioning of those machines had been late. There is also little in the evidence that Murata and Demag should be responsible for those items of delay. While HACTL alleged that GPY had caused the delays, GPY's case was that the delays were consequent upon HACTL continuously giving instructions for additional and extra works. It is impossible, in the short time available to the inquiry, to find out whether it was one or the other or both who should be responsible for the delays. In the circumstances, the Commissioners find it suffices to conclude that there were delays in the construction works, and HACTL should have known the problems that might and did arise from such delays, and should not have given the assurances to AA and Government that ST1 would be ready on AOD. In its written submissions to the Commission, HACTL argued that it fully appreciated that the building delays would interrupt the test plan and that not every component of CHS could be fully tested prior to AOD. Hence, the focus of the integrated operations testing was upon the components of CHS that would be essential for successful operation on AOD and upon the throughput demonstrated by those essential components during testing. Relying on the throughput achieved by CHS during integrated operations testing, HACTL maintained that it was reasonable for it to believe that ST1 would be able to successfully process the anticipated throughput on AOD, on the basis that other essential airport facilities and services would also be operational on AOD. HACTL further stated that 75% of ST1 was operational on AOD. The anticipated throughput on AOD, the spare capacity, system redundancy and modular design of CHS gave HACTL confidence in its readiness for AOD. While the Commissioners accept that HACTL's assurances were not lightly given and must have been based on its top management's honest assessment of the effect, that the delays in construction had and could have had on the readiness of ST1 in providing 75% of its capacity throughput, the assessment was incorrect. It can be said to be an error of judgment, which was mainly based on its unfailing performance in Kai Tak for over the past decade and consequent upon it being over confident with the software programmes that it had developed for operation of cargo handling in ST1 and its having under-estimated the harmful effect of the delay on the testing of the programmes and the mechatronics in a fully integrated manner.

14.67 The Commissioners reach the same conclusion regarding the disruptions to the testing and commissioning of the machinery and HACTL's own systems. HACTL's allegations in support of the disruptions to the preparation of CHS included mainly problems caused by the delays in the construction of ST1, in the availability of power supply to CHS, and in ST1 not having been made watertight. Again, the Commissioners are not able to decide who should shoulder the blame for these problems, whether HACTL itself, or GPY and/or other contractors or subcontractors. HACTL being confronted by all these problems and difficulties, the fact remains, as the Commissioners have found, that there was an error of judgment on its part. Despite the shortage of time, HACTL erroneously believed that all the machinery and systems would have been sufficiently tested and would have faced little problem when they were employed to work together in actual operation on AOD. HACTL was too confident that the tests done by its staff during the compressed period available before AOD and the experience of its staff in operating similar systems would enable CHS to cope with a live load operation, while overlooking that the software programmes developed for ST1 contained enhancements of or alterations to those that had been used in Kai Tak and therefore the programmes needed time to be fully and unmistakably integrated and tested before they could handle live load operations efficiently and effectively. For this, none other than HACTL itself should be responsible.

14.68 The Commissioners think that the contamination of the environment caused by the late completion of the construction and related works (such as fit-out and decoration works) was expected, and engineers had been deployed to clean and keep sufficiently clean the sensors and reflectors of BSS and CSS over a month before AOD. As no problem was expected from the contamination, there was no mention of it in the public announcements made by HACTL on 7, 8, 9 and 10 July 1998 immediately after the crash of ST1. There should be a small extent of interruptions caused by the contamination, but the extent of it was overplayed. The cause of the contamination of the environment was closely linked with the delays in construction. Similarly, the Commissioners do not think they can reach a conclusion other than to say that either HACTL or GPY or both should be responsible for the contamination.

14.69 The Commissioners acknowledge that there were two CTOs, being HACTL and AAT, and three RHOs, namely, JATS, HAS and Ogden in the new airport, and therefore the situation at the new airport was different from that at Kai Tak. In the Commission's view, these circumstances did not create much difficulty in co-ordination and understanding between the CTOs and RHOs. These different circumstances were known at the planning stage and frequent meetings had been held among all those involved to design procedures for the smooth running of the cargo handling services in the new airport. There was no lacking in the spirit of cooperation amongst all parties in spite of their being competitors. Instead of a machine having only two components, the machine is run by several components instead. One may well expect a short period of time for the slightly larger number of components to settle down to provide a smooth running. The Commissioners think it is an exaggeration to say that the slightly larger number of partners became a contributing factor to the failure of ST1 on AOD.

14.70 It is to be expected that RHOs were not too familiar with the geography of the new airport, the facilities available, and the work required of them, but there is little evidence to show that they did not follow the procedures agreed amongst themselves and the CTOs to be used at the opening of the new airport, so much so as to cause ST1 to shut down. During cross-examination of the CTO and RHO witnesses, it was alleged time and again that the hand-over procedures were not followed by RHOs, but no particulars were available as to the manner in which RHOs were not compliant with the procedures. In the opinion of the Commissioners, the insurmountable problems were those encountered by CHS itself, and they spilled over to affect the operations of RHOs. Admittedly, RHOs were very much distracted by the difficulties they were facing with their handling of baggage and serving aircraft and passengers, mainly caused by the malfunctions of FIDS and the delay in aircraft arrival and departure. However, but for the failure of CHS, the Commissioners do not think that the problems facing RHOs would have any noticeable effect on the smooth running of ST1 on AOD. The Commissioners do not think that RHOs should fairly be held responsible on this score except for a very small part of the blame for the inadequate co-ordination between them and CTOs.

14.71 The allegation that dollies at the new airport for carrying cargo between ST1 and aircraft were insufficient is rejected. Had CHS worked as well as expected by HACTL, there would be little difficulty with the number of dollies. The slow response of the mechatronics of CHS and the change to manual mode operation reduced the speed in the processing of cargo at ST1, resulting in the dollies being detained for much longer than the agreed turnaround time of half an hour. Thus, the 1,030 dollies that were available in the new airport, as compared with the about 530 available in Kai Tak, were found to be insufficient for HACTL's purposes. The dollies being found to be insufficient was an effect rather than a cause of the failure of ST1.

14.72 HACTL alleged that FDDS or FDDFS was not providing flight-related information to ST1 as expected or at all, causing trouble or inconvenience in the operation of cargo handling. The Commissioners find that this must have to a certain extent adversely affected the cargo handling by HACTL. However, the impact should, in normal circumstances, be reflected by HACTL having to deploy several members of its staff to obtain the necessary flight information from customers, airlines, the AOCC or others, instead of causing the paralysis of ST1. The Commissioners consider this as a contributing factor towards the trouble encountered by ST1 on AOD, but no further. For this failure, the main culprit must be AA, who failed to provide the necessary flight information through Airport Operational Database ("AODB") from which the FDDS and FDDFS drew the information. Apart from AA, there may be other parties responsible, which will be dealt with in the chapter devoted specifically to FIDS.

14.73 Having considered all the evidence, the Commissioners make the finding that the main cause of the failure of ST1 was that there were probably faults in the interface between LCS and BSS and between LCS and CSS. Those faults manifested on AOD in slow response of BSS and CSS. The operators of the mechatronics of both BSS and CSS resorted to manual mode operation, in order to improve on the speed. As the operators were not used to or well trained in using the manual mode, or using it on a large scale, they either forgot to input the necessary data into LCS or input incorrect data into LCS, adulterating the inventory record kept by LCS. The inventory was eventually corrupted to such an extent that there must be a manual inventory check to purge it. The personnel doing the manual inventory check unwittingly and inadvertently conjured up a software programme that had the effect of deleting the whole inventory. Although the old inventory could subsequently be found as stored in the computer system, HACTL was not sure of the reason for the deletion of the inventory, thus severely sapping HACTL's confidence in the integrity of its computer software, requiring some investigation to be made. For investigating the true cause for the slow response, HACTL needed to clear BSS and CSS of all cargo already loaded into these two systems. The backlog of cargo lying around ST1 was very large, and this backlog must be moved somewhere else before BSS and CSS cargo could find some place to be put. A decision was therefore made to transport all the cargo, both the backlog and those to be removed from BSS and CSS, to Kai Tak so that a thorough investigation could be undertaken. Repairs or improvements were then done to LCS, BSS and CSS, especially to ensure that there was no problem regarding their use in a fully integrated manner. Embargoes were therefore announced one after another, and the major operations for processing cargo were brought back to Kai Tak in the meantime. For all these, HACTL is solely responsible.

14.74 HACTL contended that the LCS-CSS and LCS-BSS software was of sound design and performed satisfactorily on AOD. No significant changes have been made to the software since AOD. The inventory mismatches and the accidental deletion of the container inventory occurred through human error and they were not software problems. Although the LCS-CSS and LCS-BSS experienced expected problems on AOD, those problems did not in themselves lead to a breakdown of CHS on AOD. HACTL explained that LCS-CSS throughput testing and integrated operations testing of CHS were successfully conducted in the period from January to June 1998. It was not possible for HACTL to carry out effective simulated live load testing on CHS (including CSS) prior to opening of the new airport. Such testing could only be achieved by a soft opening of the cargo handling operation at ST1. Manual mode testing of CSS was carried out during the hand-over of the cargo handling machinery from equipment suppliers to HACTL. HACTL's supervisory operational staff were trained and familiar with operations in manual mode. In view of the fact that ST1 was not designed for terminal-wide manual operations and that the extent of terminal-wide manual operations on AOD was unforeseeable, training of lower grade operational staff in full manual operations was not viewed as essential for successful operation on AOD and consequently not conducted. The unexpected widespread manual operations of CHS in a new working environment inevitably led to container inventory mismatch and a slowdown of the overall performance of CHS.

14.75 The Commissioners are not persuaded by HACTL's contentions and explanations. It may be useful to look at the causes in a chronological order. Prior to 13 January 1998, when AOD was announced, HACTL gave the assurance to AA that it would be ready with 50% throughput capacity in April 1998. After the announcement of AOD on 13 January 1998, HACTL was relieved that it had three more months to get ready, and instead of reaching 50% capacity in April and 75% in June 1998, it started to give assurances to AA and Government that ST1 would be ready on AOD with 75% throughput. The only concern that HACTL had was with the completion of the construction works, and when the TOP for ST1 was issued on 3 July 1998, HACTL was honestly sure that its assurances would be fulfilled. HACTL was confident with the operational efficiency and effectiveness of its CHS because the testing and commissioning of BSS and CSS were expected to have been completed prior to AOD. HACTL did not anticipate that any major problem would arise when CHS, with BSS and CSS integrated with the software programmes, started to operate on AOD or a few days before. The confidence was induced by the good and almost unfailing record of the software programmes that HACTL installed for ST1. These software programmes had been used in HACTL's establishment at Kai Tak and had been tested quite substantially off-site before they were introduced at ST1. However, HACTL under-estimated the significance of having the software tested thoroughly when integrated with BSS and CSS as the software was not the original version as that used in Kai Tak but had been enhanced for adoption at ST1.

14.76 In its submissions, HACTL denied that there was under-estimation and alleged that the level of throughput achieved during the integrated operations testing showed that the higher level computer systems had been successfully integrated with CSS and BSS by AOD. The Commissioners consider the submissions unacceptable and against the facts found. HACTL also failed to realise the seriousness of the delays of the construction works that had substantially reduced the testing times. The confidence and under-estimation was manifested in HACTL not having any viable contingency plans for the failure of CHS. The main contingency plan, as described by W7 Charter and W2 Yeung, was merely that the 75% throughput capacity was an over-provision for the amount of cargo that ST1 was expected to handle on AOD which was assessed to be about 50% of HACTL's throughput capacity. By reason of this over-provision of capacity and the modular design of CHS, HACTL was confident that there would not be difficulties in handling the expected throughput on AOD. However, what seems not to have been considered is that the modular design was only available to save the day if there was nothing wrong with LCS, which operated CSS in the same automatic mode as it operated BSS. If there was problem with the LCS, as the Commissioners find probably to have been the case on AOD and weeks thereafter, the automatic mode would all be lost, affecting ST1 terminal-wide. The modular design can only be relied on if part of the mechatronics (ie, CSS and BSS), as opposed to LCS, fail as they would only affect ST1 regionally. Nor does the evidence show that HACTL had made any risk assessment of CHS failing. In their submissions, HACTL elaborated that it was not feasible (either practically or commercially) for it to operate Kai Tak and ST1 simultaneously with a trucking arrangement on AOD. Its contingency plan with regard to the unavailability of flight information at ST1 proved unworkable on AOD due to the complete lack of flight information even in PTB. The Commissioners do not find HACTL's explanation useful in understanding what their contingency plans, if any, were in case of CHS failure. Even if such plans did exist, they certainly did not help in ensuring that ST1 functioned smoothly on AOD and the following weeks.

14.77 On AOD, about 2,000 containers had been transferred from Kai Tak to ST1. In addition, cargo arriving from inbound flights started to accumulate. HACTL's operation staff began to notice slow response with both CSS and BSS. That was mainly caused by LCS not operating PLC and the mechatronics smoothly. W7 Charter admitted on oath that the fault level of CHS was one of HACTL's primary problems, together with the difficulties it was having with LCS and that those were the main reasons for the breakdown on AOD. The absence of flight information from FDDS was a contributing factor but that would only drain HACTL's workforce by several members of its staff requiring them to get the necessary flight information. There would be little impact if CHS was operating normally. Dust was another contributing factor, but both the failure of FDDS and dust are viewed by the Commissioners as minor as compared with the main causes for the breakdown. The circumstances that there were three RHOs and two CTOs and the unfamiliarity of RHOs with cargo handling work also would not have caused any noticeable problem had LCS worked properly and smoothly. The slow response of CHS led HACTL's operators to switch into manual mode, instead of the pre-set automatic mode. Although this helped cargo processing, it was still much slower than the automated process. As a result, the procedures of hand-over of cargo that had been agreed between HACTL and RHOs could hardly be followed, and inbound cargo were left by RHOs on dollies outside the airside at the northern part of ST1. Dollies were detained for much longer than the agreed turn-around time of 30 minutes, and as a result, there was a shortage and RHOs placed the goods from the dollies onto the ground in order to retrieve the dollies for other inbound cargo. These matters were not causes for the breakdown of ST1, but rather consequences.

14.78 After HACTL's operators switched into manual mode in operating CSS and BSS in many areas of the mechatronics, human errors in not updating LCS or updating it incorrectly caused the inventory to be adulterated, so much so eventually that there had to be a physical check of the inventory. During the course of the physical check, a utility programme was inadvertently switched on which erased the inventory. This gave rise to grave concern to HACTL as it had to find out the reason before there was any meaningful rebuilding of the inventory. At the same time, investigation had to be made as to why LCS was not operating as smoothly as expected. All these problems resulted in the embargo announced in the days following AOD, so that the cargo at ST1 could be cleared from CHS and moved to Kai Tak for processing. During the period of the embargo, the cargo were removed out of CSS and BSS, the equipment was cleaned, and CSS and BSS contractors were instructed to cut the link between LCS on the one hand and PLC and mechatronics on the other. Thereafter, CSS and BSS could be operated smoothly in an off-line or manual mode. In the meantime, HACTL was debugging or enhancing LCS and the software of the higher levels of CHS, leading to recovery.

14.79 The cause for the deletion of the inventory was found as early as 8 July 1998, but HACTL announced a 9-day moratorium on 9 July 1998. Had there been nothing wrong with the computer systems, HACTL would not have imposed the lengthy moratorium even after the reason for the deletion of inventory had already been known.

14.80 It is therefore clear, and the Commissioners find on the balance of probabilities that the following parties are responsible for the breakdown of ST1 on AOD and in the period of about a month thereafter:

(a) HACTL is responsible for giving the assurances to AA and Government that ST1 would be ready to provide 75% of its throughput capacity on AOD;

(b) Either HACTL or GPY or both are responsible for the delay in the construction works at ST1;

(c) Either HACTL or GPY or both are responsible for the delay caused to the installation of the machinery and systems at ST1 and in the testing and commissions of such machinery and systems;

(d) HACTL knew of the delays in (b) and (c) above, and is responsible for under-estimating their effects on the readiness of ST1 to operate efficiently on AOD;

(e) Contamination of the environment on AOD was very minor, and would pose little difficulty to HACTL in the operation of its CHS;

(f) Contamination of the environment, anyhow, was known to HACTL as early as late April 1998, and HACTL is responsible for not sufficiently clearing the environment for the proper and efficient operation of CHS;

(g) The circumstances of there being three RHOs and two CTOs were known to HACTL long before AOD, and RHOs' involvement with cargo handling could hardly be described as an appreciable cause for the breakdown of HACTL;

(h) The ramp chaos and alleged insufficiency of dollies were consequences of the slow response of CHS in processing cargo and not the causes of the slow response;

(i) The failure of FDDS or FDDFS (for which AA and others are responsible) also would not have been a serious threat to the efficient operation of CHS, as HACTL could have used a few employees to obtain the necessary flight information;

(j) The late delivery of pre-manifests by airlines and the new C&ED customs clearance procedures would cause some inconvenience to HACTL but did not contribute to the breakdown of ST1; and

(k) The main causes for the breakdown of ST1 were (i) the faults with CHS which resulted in the inefficiency of LCS in controlling and operating PLC and the mechatronics, (ii) the insufficient testing of CHS in fully integrated mode, and (iii) the insufficient training and unfamiliarity of HACTL's operation staff with operating CSS and BSS in manual mode; and for all these HACTL is solely responsible.

Section 5 : HACTL's Best Endeavours Basis

14.81 It has always been HACTL's emphasis that it was not under any contractual obligation to anyone to provide on AOD a cargo handling throughput of 75% of the full capacity of ST1 or at all. The 75% capacity means 5,000 tonnes of cargo a day or about 1,800,000 tonnes a year. The franchise agreement made between HACTL and AA clearly and indisputably stipulates that HACTL shall achieve 75% capacity by 18 August 1998, and not on any earlier date. HACTL only promised to use its best endeavours to be ready with 75% capacity on 6 July 1998, the

AOD, and this basis was not contractual or obligatory and stemmed merely from goodwill or a gentlemen's understanding or agreement.

14.82 A best endeavours basis is obviously different and has to be distinguished from a contractual basis. A contractual basis imposes or results in an obligation the non-fulfillment of which will attract contractual liability attached. On the other hand, a best endeavours or best efforts basis involves no contractual obligation and therefore no contractual liability attached. Contractual liability apart, a promise to exercise best endeavours requires examination of two elements: first, whether the promising party has in fact used its best endeavours to perform the promised task and secondly, whether the promised task has been satisfactorily performed. If the promising party has used its best efforts, but the promised task is not performed satisfactorily, no blame can be attached to it since it has already done what it has promised. If, however, the promising party has not used its best endeavours as promised and the task is not performed, then the promise is not kept, regardless whether any contractual liability arises. In this case, it is not that HACTL did not use its best endeavours as promised, because the Commission feels and finds that HACTL did use its best efforts in the circumstances. The fact that it committed and expended additional funds in the Supplemental Agreement with GPY to accelerate the building works so as to complete the works ahead of the contractual date of 18 August 1998 bears fine witness. What is crucial is that HACTL represented to AA and Government that ST1 would be ready to produce 75% of its throughput capacity on AOD. This was a representation that was relied upon by the representees. It might have been a representation of a future event, but regardless, it was a representation based on an estimate of the status current at the time when the representation was made. It was a representation of an estimate that turned out to be wrong, and a wrong representation that was relied on for its honesty and accuracy by the representees. If the representation was that ST1 would not be ready, there could be no contractual obligation or liability, and the representor could not be blamed either, but the representation of readiness makes HACTL blameworthy, and for that HACTL must be responsible. A good illustration of the situation is readily available from what had happened with MTRC. MTRC was contractually obliged to complete AR by 21 June 1998. Despite the fact that Government expected MTRC to be able to gain time during the course of its construction and installation works, so that the new airport which was expected to be ready in April 1988 could open for operation in April with the substantial transportation support provided by AR, MTRC maintained that AR would not be ready by April 1998. At the request of ADSCOM, MTRC made a presentation about its progress to ADSCOM in October 1997, and on that occasion maintained that AR would not be ready until the contractual completion date. There was no promise of using best endeavours, because best endeavours would not enable MTRC to abridge the time for completion of its works. Nor was that any representation that AR would be ready earlier than the contractual completion date, and no one was misled. MTRC could not be blamed, nor is there any evidence that ADSCOM or Government or AA ever at any time blamed it for not being able to complete AR ahead of time.

14.83 Apparently, HACTL was too confident of its ability and capacity in the development and commissioning of its CHS, so confident that even the enormous delays in ST1's construction works did not cause it to engage in any risk assessment seriously, nor to cause it to realise the risks of non-readiness sufficiently enough to suggest a deferment of AOD or to insist on a soft opening. Its continual success and reputation of efficiency and capacity in the cargo handling field for over a decade doubtless contributed towards its over-confidence and complacency. That success and reputation had also lulled AA, New Airport Projects Co-ordination Office and ADSCOM into placing too much reliance on HACTL's assurance, to the extent of accepting its words without engaging in any meaningful and professional monitoring of its systems development and commissioning.

14.84 After reading through the statements of witnesses and hearing all oral testimony, the Commissioners have come to the view that although HACTL was not contractually bound to be ready with a 75% throughput on AOD, its assurances given to AA and Government that it would be so ready had given rise to a sense of security to AA and Government that ST1 would be ready to provide the necessary cargo handling facility reasonably assessed to be required of the new airport on AOD. Taking into account HACTL's unfailing success at Kai Tak, there was nothing that could induce AA or Government to doubt that HACTL would not be as good as its words. The only worry that AA and Government had about ST1's readiness was that there had been slippages in ST1 obtaining the OP. When the TOP for ST1 was issued on 3 July 1998, there was no longer anything that diluted that sense of security. HACTL's continual assurances made AA and Government confident that the decision to open the new airport should not be altered, as far as cargo handling was concerned.

14.85 When ST1 crashed on AOD, the Commissioners accept that HACTL did not fail in its contractual obligation. However, the expectations of AA and Government induced by the assurances were proven ill conceived and incorrect. Had HACTL maintained its contractual position that it would only be 75% ready on 18 August 1998 and not earlier, Government would never have made the decision to open the new airport for operation on 6 July 1998 in the first place, and HACTL could not in all fairness be blamed for not being helpful. The confidence of HACTL in its newly developed COSAC 2 and computer software programmes for CHS was too strong, and worse still the confidence was manifested in the assurances. The confidence was based on the fact that COSAC 1, from which COSAC 2 was developed, and most parts of the software programmes that were to be introduced in ST1 had worked in Terminals 1 and 2 in Kai Tak for a long time, without realising that the small amount of enhancements or alterations made to these existing software programmes would result in the systems being less reliable unless and until sufficient tests had been performed and sufficient time had been used for adapting them to the real live operations required of CHS once it started to work on AOD.

14.86 The Commissioners conclude that HACTL is responsible for giving the false sense of security to AA and Government that it was ready to operate on AOD. It would not be fair for HACTL to cling to the contractual terms to say that it is not responsible for not being ready on AOD. Even though this responsibility arose out of goodwill and a mere gentlemen's agreement without any contractual liability, the Commissioners think that leading AA and in particular Government to reach the decision on AOD and not to alter that decision is culpable, and HACTL must fairly be held responsible for that area of decision-making process and thereafter for either failing to render ST1 ready to deal with the expected tonnage of cargo on AOD as it had promised and over a month thereafter or failing to strive for a deferment of AOD or to seek a soft opening timeously.

Section 6 : HACTL's Attitude in the Inquiry

14.87 Over 10 solid days were spent in the hearing of the Commission for seeking facts and reasons relating to the question of dust, which had been raised as a major problem by HACTL for ST1's breakdown on AOD. A lot of effort was used by both counsel for HACTL and counsel for the Commission as well as the Commissioners in dealing with dust and its related problems. Had dust been raised as a minor factor contributing to the breakdown, much less effort and time would have been spent. If the Commission was empowered by the Commission of Inquiry Ordinance to award any costs against a party, it would not have hesitated to make an appropriate order relating to the time and costs wasted for dust.

14.88 One interesting thing that has come to the notice of the Commission is that it was only after 15 July 1998 that HACTL started to raise the question of environmental contamination as one of the major causes for the breakdown of CHS. Before that date, HACTL was very frank in its press releases and open statements that they imposed the moratoria in order to deal with software and hardware problems. When W50 Wong and W49 LO Chung Hing, the Vice-Chairman of the AA Board, gave evidence, they told the Commission that they paid a visit to HACTL on 14 July 1998 before they attended an AA Board meeting that afternoon. The visit was not prearranged, but was intended to show AA's sincerity and readiness to help HACTL's situation. When they met W7 Charter and W2 Yeung, there were also four to five other persons there, and W49 Lo knew that one of them was a lawyer. W50 Wong and W49 Lo were told that HACTL's operation was adversely affected by things such as the confusion at the ramp and the insufficiency of dollies. They felt that blame was put on AA and they were not too welcome, so they left very quickly.

14.89 It appears to the Commissioners that HACTL was apologetic for what had happened on AOD and the moratoria that it imposed on its customers and it was frank to let the public know what was wrong with ST1 in the first few days after AOD. After seeing lawyers, HACTL's top management were obviously advised of their possible legal liability, and thenceforth, their attitude changed, obviously for fear that legal liability might attach. HACTL had maintained the same attitude during the inquiry. Although W7 Charter was honest to admit that the dust problem was overplayed, other officers of HACTL continued to stress the major effects of dust, and even attempted to suggest strange interpretation of W7 Charter's admission. W2 Yeung was one of the protagonists of the dust theory and he also maintained throughout that there was nothing wrong with the computer systems of CHS. This is in a way understandable, for the main constituents of the software systems of COSAC were his brainchild. The evidence of all the HACTL officers and the two experts was extremely protective of this prodigy of W2 Yeung and HACTL. The result was that the Commissioners were presented with evidence and arguments that provided them with no obvious answer as to what the causes were but only what the causes were not. It is unfortunate that public funds and time had to be wasted for this uncandid attitude of HACTL.

CHAPTER 15

RESPONSIBILITY – THE OTHER MAJOR PROBLEM AND MODERATE PROBLEMS

Section 1 : Major Problem : Baggage Handling

15.1 In this Chapter, the Commission recapitulates the various problems contributing to the baggage handling chaos that are discussed in Chapter 12 and deals with the responsibility for each of them in turn.

(a) Accumulation of problem bags

[BHS 1] Cathay Pacific Airways Limited ("Cathay Pacific") and Securair Limited ("Securair") staff fed about 220 bags from Kai Tak with no baggage labels into the conveyor system at the new airport. [See paras 12.19-12.20]

15.2 In [BHS 1], Securair was engaged by all airlines (including Cathay Pacific) to transport their interline baggage from Kai Tak to the new airport. The bags were put onto the conveyor belt by Securair and Cathay Pacific staff. Cathay Pacific claimed that its staff were merely rendering voluntary assistance to Securair who had been instructed to send the bags down to the Baggage Hall, either via the out-of-gauge ("OOG") lifts or through the conveyors after "fallback tags" were put on. Securair alleged that it was only engaged to deliver the bags to the check-in counter at Check-in Area B. From there, it handed the bags over to Cathay Pacific baggage staff who was responsible for sending them to the Baggage Hall.

15.3 Without cross-examination of the relevant witnesses, it is not possible for the Commissioners to determine between Cathay Pacific and Securair, who should be held responsible for the injection of the interline bags into the system. However, there is no dispute that it was the staff of both Securair and Cathay Pacific who sent the bags to the Baggage Hall without using the OOG lift or the special "fallback tags". Both of these companies should therefore be responsible, though the Commission is not able to make a proper apportionment of the blame.

[BHS 2] Airlines checked in bags with incorrect labels or invalid or no Baggage Source Messages ("BSMs"). [See paras12.21-12.23]

15.4 In [BHS 2], from the evidence submitted to the Commission, there is no identification of the offending airlines except in the case of some 600 bags from Japan Airlines Company Limited ("JAL") and seven transfer bags from Thai Airways International Public Company Limited ("Thai Airways"). In the result, the Commissioners are unable to find which of the airlines using the new airport should be responsible except those two.

[BHS 3] Airlines checked in about 2,000 bags with invalid flight numbers. [See para 12.24]

15.5 In [BHS 3], the airlines did not inform Airport Authority ("AA") or Swire Engineering Services Ltd ("SESL") of the extra flight numbers which did not appear from the flight schedule and of the requirement for a separate flight lateral for the onward destination and should therefore be primarily responsible. Canadian Airlines International Limited ("Canadian Airlines") and Virgin Atlantic Airways Limited ("Virgin") (together with Ansett had admitted responsibility for the respective incidents referred to in paragraph 12.24 of Chapter 12. Apart from that, the evidence received by the Commission does not enable it to identify the particular offending airlines who should be responsible for the other problem bags.

[BHS 4] Aviation Security Company Limited ("AVSECO") staff rejected a large number of bags at Level 2 security screening, putting pressure on Level 3 screening, lengthening baggage handling time and causing more problem bags. [See para 12.25]

15.6 [BHS 4] is obviously a matter of familiarity and caution. Despite their training, AVSECO staff were working in a new environment with a new system. Obviously they took longer to examine the bags shown on the security screen at Level 2, and erred on the side of caution. The Commissioners do not consider that should be blameworthy. After all, it would be better for them to take slightly longer to pass a baggage, which was apparently the case, than to take chances that might create a security risk. No one should be blamed for this. The problem would not have mattered too much or at all but for the fact that there were other problems that compounded its effect.

[BHS 5] Ramp handling operators ("RHOs") delivered transfer bags from inbound flights into Baggage Handling System ("BHS") after connecting flight laterals had been closed. [See para 12.26]

15.7 W30 Mr Ben Reijers, Senior Design Engineer of AA, saw [BHS 5] as a moderate to major problem. This was obviously the fault of RHOs concerned. However, there is ample evidence to show that the late delivery of transfer bags to BHS was mainly caused by the delayed delivery of baggage to the Baggage Hall, due to the various difficulties faced by RHOs as a result of the deficiency of the Flight Information Display System ("FIDS"). The problem was exacerbated by frequent stoppages of the system including intermittent stoppages of three out of four laterals. The Commissioners think that the problem with the offending RHOs was caused by too many things they needed to do at the time and they were not too familiar with the geography or the new system. There is, however, no sufficient evidence to identify which of the three RHOs should be responsible.

[BHS 6] RHOs did not clear bags from departure laterals in time, resulting in full lateral alarms, which caused subsequent bags to go to the problem bag area. [See para 12.27]

15.8 In respect of [BHS 6], again the evidence does not indicate which RHOs contributed to this problem and the Commissioners are unable to decide which of the three RHOs should be responsible.

[BHS 7] One of RHOs, Ogden Aviation (Hong Kong) Limited ("Ogden"), put about 230 arrival bags from a KLM flight No. 887 onto transfer laterals. [See para 12.28]

15.9 [BHS 7] was an isolated incident caused by human error for which Ogden had accepted responsibility.

(b) System stoppages

[BHS 8] Bags that could not be safely conveyed were not put in tubs and OOG bags were fed into the conveyor system instead of being sent down to the Baggage Hall via the OOG lift. [See paras 12.31-12.32]

15.10 Whilst the Commissioners have little doubt that [BHS 8] did happen, the evidence does not show precisely which airlines should be held responsible.

[BHS 9] Too many erroneous emergency stops led to numerous disruption and system downtime. [See paras 12.33-12.34]

15.11 From the evidence received, the Commissioners are unable to determine who had pressed the emergency buttons, and whether accidentally or deliberately. The emergency buttons could also have been pressed to ensure safety of the staff working around the area. The person or persons pressing the buttons, albeit causing system stoppage, should in such circumstances not be held responsible. There is evidence that the protruding design of the emergency button accords with international safety regulations. In order to avoid accidental activation, SESL has subsequent to airport opening day ("AOD") introduced of a protective glass box to enclose the button. The Commissioners are of the view that the design is proper in that the button should be easily accessible to the operators of the laterals and conveyor belts to facilitate activation at once in case of danger. Such a design that incidentally increases the chances of accidental activation by persons not too familiar with the area should not properly be considered as a blemish on the design. There is no evidence as to the identity of the persons who activated the buttons to cause the stoppages on AOD and the Commission is not able to find out more about the actual circumstances surrounding the stoppages.

[BHS 10] Communication difficulties between operators in the Baggage Hall due to Trunk Mobile Radio ("TMR") overload and unavailability of other means of communication resulted in longer time for the system to be reset each time it was stopped. [See para 12.35]

15.12 When an emergency stop is activated, only a certain part of BHS will stop and the rest of the system continues to operate. On AOD, when a stop occurred, BHS operators would have to find out why, and in most cases they would visit the place where the stop took place or where the emergency button had been activated. When they found out that it was an accidental activation or the problem that required the application of the emergency stop had been cleared, they would need to notify the Baggage Control Room ("BCR") to restart the system in the relevant area. On AOD, however, it was not always easy to communicate through TMR which, because of the extreme high demand by various users, was overloaded. The resulting delay in contacting BCR was translated into delay in restarting the affected part of BHS. If another stop occurred nearby, the staff who had seen the first stoppage being cleared could not be contacted by BCR to inspect the second area, and he needed to return to BCR to take the order. While it is not able to find out the responsibility for the stoppage, as discussed in the immediately preceding paragraph, the TMR problem is dealt with in Chapters 9 and 16 of this report.

(c) Delays and confusion in handling arrival baggage

[BHS 11] RHOs had no reliable flight information from FIDS and had communication difficulties due to the overloading of TMR and mobile phones and unavailability of other fixed lines of communication. [See paras 12.37-12.38]

15.13 Flight information is crucial for the operation of RHOs in their handling of baggage. The most important information is the estimated time of arrival ("ETA") of the aircraft that they are serving as well as the parking stand. With these two pieces of information, they are able to plan the deployment of their baggage tractors to the allocated stand to await the arrival of the flight to unload the baggage and transfer it to the Baggage Hall. Similarly, the estimated time of departure ("ETD") and parking stand are important for RHOs to send baggage to the flight. Due to the unreliability of FIDS on AOD, TMR was used by RHO personnel to pass these kinds of flight information. When TMR was overloaded, some RHOs resorted to their own mobile phones, only to find that they were also overloaded. There were hardly any telephones installed in the Baggage Hall close to the laterals and not all the telephones for the RHO offices were completely installed or functional. It is not difficult to imagine that delays in baggage handling resulted. The problems regarding TMR, mobile phones, conventional phones as well as FIDS are dealt with in Chapters 9, 10, 13 and 16 of this report.

[BHS 12] RHOs did not use both feedlines of the reclaim carousels. [See para 12.39]

15.14 According to Hong Kong Airport Services Ltd ("HAS"), the rear feedline would only be used in exceptional circumstances with particularly heavy baggage demands. Whilst Ogden and Jardine Air Terminals Services Ltd ("JATS") also confirmed that they were aware of the additional feedline, it is not clear from the evidence why it was not used. JATS in its submission quoted the evidence of W6 Mr Samuel KWOK King Man, Business Support Manager of HAS, who testified that only one lateral was working. However, W6 Kwok was merely referring to the transfer laterals which did not seem to relate to the conveyors for the reclaim carousels at which passengers were to reclaim their luggage. HAS claimed that the failure to use the rear feedline would not have slowed down the baggage handling process. Although the use of both feedlines might have expedited the despatch of baggage to passengers at the reclaim belts, the Commissioners consider that the time that could have been saved would be slight. This problem would have been negligible but for the other problems surfacing on AOD. This appears to be a familiarisation problem with RHOs, to which the Commissioners will return later.

[BHS 13] RHOs did not know the assigned lateral for arrival bags. [See paras 12.40-12.42]

15.15 Without a usable pre-allocation template in [BHS 13], RHOs needed to find out the allocated lateral by other means. The liquid crystal display ("LCD") board situated at the entrance to the Level 2 Baggage Hall that should indicate the match of flights to laterals was not working, and RHOs arriving at the Baggage Hall with baggage from aircraft could not know at a glance the allocated lateral. There were inadequate back-up measures to address the lack of accurate information for RHOs at the Baggage Hall. AA admitted that no whiteboard was placed at the entrance to the Baggage Hall to direct RHOs to the correct arrival carousel conveyors or laterals until Day Two. According to discussions before AOD between AA and SESL on baggage handling procedures in the event of FIDS failure, SESL was to arrange for fallback signage at the Baggage Hall. Given the knowledge that FIDS might not be available in the Baggage Hall on AOD, AA and SESL should have ensured there were sufficient whiteboards to give RHOs the necessary information.

15.16 While AA and SESL must be responsible for not having whiteboards or fallback signage made available at the Baggage Hall to direct RHOs to the proper areas and laterals, SESL might not reasonably expect a FIDS failure. It is difficult to apportion the blame on the evidence.

15.17 Counsel for the Commission submitted that SESL should be responsible for change in the allocation since it had not followed the templates it had given to RHOs for the pre-assigned lateral allocation. While this argument is attractive, the Commissioners do not feel that the evidence is sufficient to hold that it was unreasonable or improper for SESL to disregard the template in the hope of facilitating better use of the laterals, in accordance with the actual flight times. Anyhow, SESL quickly returned to use the information on the template. The crux of the problem was the deficient operation of FIDS, which was the cause for the LCD board to go blank and for the difficulties experienced by the SESL operators in BCR.

[BHS 14] RHOs abandoned unit load devices ("ULDs") around arrival baggage feedlines, causing congestion and confusion in the Baggage Hall. [See para 12.43]

15.18 Ogden thought that this matter was more the effect of problem baggage accumulation rather than the cause, for which no RHO was responsible. HAS attributed this problem to AA's failure to provide RHOs with a baggage staging area for temporary storage of problem bags, despite many requests by RHOs before AOD. HAS alleged that on AOD, the large number of problem bags were sorted and loaded in ULDs. Because there was no baggage staging area, the only place available for the temporary storage of ULDs was the space around the arrival baggage feedlines. The Commissioners consider the arguments of both Ogden and HAS sound. This matter was an effect rather than a cause. Insofar as there were too many problem bags, which was the situation on AOD, they would cause congestion, regardless of where they would be put, unless there was a large staging area to accommodate them. However, they were put in the ULDs which were placed around the feedlines, which obviously caused inconvenience and even inaccessibility of the feedlines. As there is no evidence that any other place in the Baggage Hall was available to accommodate these ULDs, the Commissioners feel that it might be unfair to criticise any one of RHOs. This is rather a matter caused by the insufficient contingency planning of AA.

[BHS 15] FIDS workstation in BCR performed slowly and hung frequently. [See para 12.44]

15.19 [BHS 15] relates to the inefficiency of FIDS which has been dealt with in Chapter 13.

[BHS 16] There was no reliable flight information displayed on the LCD in the Baggage Reclaim Hall (BRH"). [See para 12.45]

15.20 When W21 Mr Michael Todd Korkowski, Site Project Manager of Electronic Data Systems Limited ("EDS") gave evidence, he said that information from FIDS to the baggage laterals was incomplete because of problems with the BHS/FIDS interface. This resulted in arriving passengers not having clear, correct and timely information for reclaiming their baggage. EDS alleged that SESL staff in BCR did not always correctly progress the baggage status, so that information about baggage reclaim was cleared off the display LCD boards too early, or was delayed in reaching the LCD boards. This was denied by SESL who attributed the problem to slow and unstable performance of FIDS. There is ample evidence that FIDS did suffer from slow system response as early as 6 am on AOD, and the operation on the FIDS Man Machine Interface ("MMI") in BCR was so slow (about 20 minutes for a function to be carried through) that eventually, according to W26 Mrs Vivian CHEUNG Kar Fay, Terminal Systems Manager of AA, the function was taken away from BCR to be performed by staff in Airport Operations Control Centre ("AOCC"). In the circumstances, the Commissioners prefer the evidence of SESL to that of W21 Korkowski. The matter, concerning FIDS, is also discussed in Chapters 10 and 13.

(d) Stretching of RHOs resources

[BHS 17] On AOD, RHOs had inadequate manpower deployed at the problem baggage area to remove the large number of bags going there. [See paras 12.46-12.48]

15.21 W30 Reijers considered that [BHS 17], namely the insufficient resources of RHOs, was a major problem as it was clear that there were not enough people to remove the problem bags from the problem bag area.

15.22 HAS handled about 52% of total air traffic movements. It had 240 staff on roster in the baggage team, the majority of whom had been working for Hong Kong Air Terminal Services Ltd ("HATS") (the sole RHO in Kai Tak) or Cathay Pacific at Kai Tak before joining HAS and should thus be experienced in airport operations. HAS considered the number to be sufficient as HATS at Kai Tak had 300 staff to handle

100% of all the traffic movements there, taking into account the larger airport at Chek Lap Kok ("CLK") and possible disruptions at a new airport. JATS claimed that with the exception of the Managing Director and one other manager, the whole of the operational arm of the company is ex-Kai Tak. Ogden operated 15 passenger and six freighter flights per day or approximately 9% of the total ramp handling market at the new airport. On AOD, Ogden handled 13 departing and 13 arriving flights out of a total of about 250 flights, or 5% of the flights. Of 230 employees, 58 were previously hired at Kai Tak and 12 by airlines at Kai Tak or other airports. Employees without extensive experience were trained, albeit under considerable access constraints to the Baggage Hall.

15.23 Having considered the figures in the preceding paragraph, the Commissioners find it improbable that there would have been a manpower shortage with RHOs, had the problem bags not been of the unexpectedly large number on AOD. The drain on their manpower was caused by the inefficient operation of FIDS and the other many problems that occurred in a vicious cycle and a downward spiral on AOD. The Commissioners do not feel that RHOs should be criticised for not removing the problem bags in time, which came in at the rate of 15 per minute instead of one per minute under normal circumstances. The large number of the problem bags, in the Commission's view, could not reasonably have been foreseen by RHOs.

[BHS 18] The Remote or Hot Transfer System, although available, was not used to handle transfer baggage with the result that all transfer baggage was handled only by the Central Transfer System in the Baggage Hall, which slowed down operations. [See para 12.48]

15.24 W30 Reijers thought that the effect of not using the remote transfer system in [BHS 18] was minor. The Commissioners agree. But for the other problems that surfaced on AOD, this matter would have been negligible and might very well not have been noticed.

(e) <u>Inexperience or unfamiliarity of airline, RHO and SESL staff</u>

[BHS 19] Inexperience or unfamiliarity of airline, RHO and SESL staff.

[See para 12.50]

15.25 W30 Reijers considered the inexperience of airline, RHO and SESL staff to be a moderate problem.

15.26 RHOs' experience has been described under [BHS 17] above. HAS and Ogden initially claimed that AA was primarily to blame for the inexperience of their staff with operating the new system and in a new environment. They said AA denied them adequate access to the apron and baggage basement, ie, the Level 2 Baggage Hall, and did not provide sufficient opportunities for them to train their operators. JATS maintained that their staff were well-trained and were "absolutely ready for performance on AOD". W8 Mr MacKenzie Grant, Managing Director of Ogden, testified to claim that given the limitations of time and the state of construction that the new airport was in, Ogden staff had been adequately trained. Bus service and tractor markings on the apron were in place towards the end of May 1998, giving some opportunity to train before the final airport trial on 14 June 1998. At the trials of 2 May and 14 June 1998, aircraft serviced by HAS were flown into the new airport and HAS staff simulated dummy baggage runs from aircraft to Baggage Hall with tractors. There had been sufficient liaison meetings between AA, RHOs and baggage handling working groups.

15.27 Counsel for the Commission submitted that had AA organised more or more realistic trials, the staff of the airlines, RHOs and SESL would have been better prepared for AOD. As W6 Kwok of HAS pointed out, there were only several hundred pieces of baggage between all three RHOs used for the trials. The relatively few bags would not have caused a system jam. They would not pile up at the end of the conveyor, nor activate the stop buttons. The trials did not sufficiently simulate a real life situation where the conveyors were full of bags and people were turning round, pulling bags off, and so on.

15.28 Viewing the evidence as a whole, the Commissioners find it improbable that the staff of RHOs were inexperienced, because many, if not most, of them had done the same kind of job in Kai Tak. The same finding should also apply to the staff of SESL. SESL was the builder and developer of BHS and probably their staff deployed to operate in

BCR as well as in the Baggage Hall would have been well trained for the job and would have ample opportunities to get hands-on training with the system during and after the system testing stage. On the other hand, there is evidence to show that not too many or readily available opportunities were given by AA to RHO staff to get familiar with BHS and the environment and geography of the Baggage Hall. There must also be a certain amount of truth in the evidence that airline staff (and of course, Securair staff) were not too familiar with handling OOG and baggage that needed to be put in tubs, because BHS and the working environment was new to them. The lack of complete or accurate flight information over the FIDS monitors and LCD boards must also have caused them great trouble in having to answer numerous enquiries from passengers, inconvenience and anxiety. The Commissioners come to the view that it was more because of unfamiliarity rather than the lack of experience or training on the part of the airline, RHO and SESL staff that caused the problems with baggage handling on AOD, though undoubtedly more hands-on training would have resulted in more familiarity in operations. There were a number of incidents of human errors, such as items [BHS 1], [BHS 5], [BHS 6], [BHS 7], [BHS 8] and [BHS 9], which indicate the unfamiliarity with BHS and the environment. However, it was the concatenation of such problems, which was not and could not reasonably have been foreseen, that caused the chaos and great inconvenience to the passengers on AOD and the few days thereafter.

15.29 The Commissioners consider that AA should bear some responsibility for the lack of familiarity of the airline, RHO and SESL staff with baggage handling procedures, with BHS and the working environment. There were slippages of the construction works in respect of the Passenger Terminal Building ("PTB"), and the Baggage Hall was not made available for the familiarisation process of RHOs on sufficient occasions. The Commissioners also opine that the unfamiliarity might not have been so serious had AA planned and worked out with RHOs the required resources for coping with baggage handling in case of FIDS failure. This is a matter of lack of sufficient coordination, for which AA should be responsible.

15.30 According to W30 Reijers, [BHS 1] to [BHS 4] combined to create a major problem. The evidence shows that [BHS 1] involved 220 bags, [BHS 2] involved 600 bags, [BHS 3] involved 2,000 bags and [BHS 4] involved 6,705 bags going for level 3 screening. Counsel for the Commission submitted that [BHS 1] to [BHS 4], [BHS 5] to [BHS 7] and [BHS 18] together created a major problem. The Commissioners feel that it would not be productive to attribute to any particular item or series of items as the major cause for the baggage chaos on AOD. Each of the problems compounded its effect with that created by the others. It is difficult to estimate the proportion of blame in respect of each. For example, the Commissioners may be correct to find that 99 emergency stoppages of BHS on AOD [BHS 9] as a major cause, but that finding cannot fairly or properly be made without any evidence as to how long and how serious the disruptions were to the operation of BHS. Each of the items contributed to the problem which was serious and widespread, but each of them in itself would not have caused a major problem and could have been handled satisfactorily by the system and operators.

15.31 It is important not to lose sight of the fact that the inefficiency of FIDS on AOD drained heavily on the resources of RHOs in obtaining the necessary stand and time information, resulting in delay in their baggage handling activities. FIDS is connected with the items [BHS 5], [BHS 10], [BHS 11], [BHS 13], [BHS 15] and [BHS 16]. The lack of necessary flight information also affected RHOs who had to service passengers, such as HAS having to provide mobile steps and tarmac buses to disembark and transport passengers at remote stands, while all RHOs were affected in their deployment of operators for operating airbridges for planes parked at frontal stands. The full apron situation from midday to 5 pm and from 8 to 11 pm, requiring planes to wait for parking stands, also affected RHOs' services. Had the FIDS problems not occurred on AOD, RHOs would have had more staff available to assist in sorting out problem bags, and might have alleviated or even eliminated the baggage chaos.

15.32 In the examination of the baggage handling problems, references are made to airlines and RHOs. For the avoidance of doubt, the Commission would point out that save where expressly indicated, no attempt was made to pinpoint any particular airline or RHO who was involved in a particular problem or who should be responsible for it. The reason is that whilst the evidence shows that airlines or RHOs were involved, the Commissioners do not have sufficient evidence to single out any particular party. The Commissioners do not consider that such approach would be unfair to any one of the airlines or RHOs. It is appreciated that they are business competitors in their respective fields, and any finding against anyone might damage it in its competitiveness. Nonetheless, insofar as airlines and RHOs are found in this inquiry as a class to be involved, the Commissioners are not persuaded that any particular one of them will be prejudiced or should feel unfairly treated. After all, the task of the Commission is to find out the truth as borne out by the evidence, and the public's interest in getting to know such truth should override any claim of prejudice suffered by a particular group or class in the community.

Section 2 : Moderate Problems

15.33 The following provides easy reference and the responsibility for each of the moderate problems will be dealt with in turn:

[26] Delay in flight arrival and departure: paras 8.27 and 12.55-12.61;

[27] Malfunctioning of the Access Control System ("ACS"): paras 8.28 and 12.62–12.86;

[28] Airside security risks: paras 8.29 and 12.87–12.101;

[29] Congestion of vehicular traffic and passenger traffic: paras 8.30 and 12.102–12.109;

[30] Insufficient air-conditioning in PTB: paras 8.31 and 12.110–12.133;

[31] Public Address System ("PA") Malfunctioning: paras 8.32 and 12.134–12.166;

[32] Insufficient staff canteens: paras 8.33 and 12.167–12.173;

[33] Radio frequency interference ("RFI") on air traffic control frequency: paras 8.34 and 12.174-12.178;

[34] Aircraft Parking Aid ("APA") malfunctioning: a Cathay Pacific aircraft was damaged when hitting a passenger jetway during parking on 15 July 1998: paras 8.35 and 12.179-12.190;

[35] An arriving passenger suffering from heart attack not being sent to hospital expeditiously on 11 August 1998: paras 8.35 and 12.191-12.193;

[36] Fire engines driving on the tarmac crossed the path of an arriving aircraft on 25 August 1998: paras 8.35 and 12.194-12.197;

[37] A HAS tractor crashed into a light goods vehicle, injuring five persons on 6 September 1998: paras 8.35 and 12.198;

[38] Tyre burst of United Arab Emirates cargo flight EK9881 and runway closures on 12 October 1998: paras 8.35 and 12.199-12.200; and

[39] Power outage of SuperTerminal 1 ("ST1") due to the collapse of ceiling suspended bus-bars on 15 October 1998: paras 8.35 and 11.15.

Section 3 : Responsibility

[26] Delay in Flight Arrival and Departure [see also paras 8.27 and 12.55–12.61]

15.34 Flight delay was a consequential problem caused by a number of factors, such as the deficient FIDS, the baggage handling chaos, the ACS and PA malfunctioning, confusion over parking of planes, malfunctioning of airbridges, late arrival of tarmac buses, communication problems experienced by RHOs and the other operators at the new airport and the cargo handling chaos on AOD. The parties responsible for these matters are described separately in the rest of this chapter and other parts of the report.

[27] Malfunctioning of ACS [see also paras 8.28 and 12.62–12.86]

15.35 Please refer to the paragraphs under item [27] "Malfunctioning of ACS" in Chapter 12 for the nature and causes of the problems. A lot of conflicting allegations and issues were raised by AA and the contractor under contract C396 for ACS, Guardforce Limited ("Guardforce"). Some of the allegations are set out below prior to the Commission dealing with the question of responsibility.

(a) Delay in permit production

15.36 The Commissioners noted that in the original response from Guardforce dated 14 September 1998, it said it would not describe the delay to the production of permits arising out of late changes as serious. W47 Mr Graham Morton, Project General Manager of Guardforce, stood by this statement and testified that at all times they were able to provide passes which allowed the system and the airport to continue operation.

15.37 Guardforce also claimed that although there had been downtime of the system at the Permit Production Office for about 31 hours, out of a total operating time of 1,440 hours, it considered this not to be a serious problem. It was alleged to be minimal in comparison to the time that ACS had been operational. The system downtime was caused by the instructions to include Chinese text on the permanent permits (sometimes called badges) and teething problems with the ACS software. In order to include Chinese text, the system had to change to Windows NT 4.0 which had a known software bug that occasionally prevented the users from being able to log onto the system temporarily.

15.38 Guardforce received AA's instructions to change the design for the permanent staff security permits to include Chinese characters. It then instructed Controlled Electronic Management Systems Limited

("CEM") to develop the necessary software. There is a discrepancy as to the time when such instructions were issued. Guardforce's reply to the Commission stated that the instructions were not given until February 1998. At the inquiry hearing, W47 Morton however accepted that the instructions were received in November 1997. On the other hand, CEM claimed that it did not receive a confirmation of the order until the end of April 1998. Guardforce claimed that the absence of Chinese text software should not have prevented the issue of permits, as AA could still issue effective permits without any Chinese text.

15.39 AA alleged that the CLK computer system for permit production was not operational until 7 August 1998. Prior to August, Guardforce used a standalone system situated at Kai Tak as an interim measure. This Kai Tak system and its printing equipment broke down frequently in May 1998 and the Permit Office staff had to perform tasks by hand to complete permits which caused delay in the permit production process. A second Permit Office was opened in June at CLK, but the server for the Kai Tak system could not cope with the two locations and further breakdowns occurred. The numerous breakdowns in the computer system in Kai Tak and at the new airport were evidenced by the schedule of breakdown exhibited to the witness statement of Mr Joseph WONG, Deputy General Manager of AVSECO, and a letter of complaint from AVSECO to Guardforce about the downtime on 20 August 1998.

15.40 W 47 Morton disagreed that the CLK permanent permit system was in use only on 7 August 1998. This appears to be inconsistent with his evidence that the first permits with Chinese text were produced on 8 August 1998. He agreed that the system was slow on occasions due to a software bug. This was due to the use of the commercial off-the-shelf product required for the Chinese software (ie, Window NT 4.0) which had a known software bug. Also on two occasions, power failures or power changeovers caused the downtimes.

15.41 According to CEM, there was bound to be downtime to run the test. The system had not been fully tested before it started for permit production. Also, the amount of alarms coming through the system caused considerable downtime, which was beyond the control of CEM.

15.42 AVSECO accepted that there were some delays in the average processing time for permanent and temporary permits. The delay as alleged by AVSECO was caused by last minute rush of unexpected large number of applications for permits by business partners and the frequent breakdown of ACS. AA also attributed some delay in permit production to the late application for permits by the applicants.

15.43 There were also problems with a lack of ink and paper for the permanent permits between middle June and the end of August 1998, which put a strain on the temporary permits production as more had to be issued. These materials could only be obtained through Guardforce from an overseas supplier. AA's version was that an order was placed for the paper in early June. On 9 June 1998, W47 Morton reported that the shipment had gone astray and he placed a new order, delivery to be on 11 June 1998. No delivery came. W47 Morton agreed when giving evidence that one shipment of paper ordered in early June went astray, but claimed that AA did not put in a fresh order until about 22 June 1998, though he was not too certain about this date.

15.44 The Commissioners find that the development and installation of ACS had been plagued by delays and various problems, which contributed to the delay in the production of permits. While some of the problems will be dealt with below in more detail, the Commissioners' findings regarding the delay in permit production are as follows:

(a) AA issued the instructions for Chinese text in November 1997 and not February 1998 as at one time alleged by Guardforce or April 1998 as alleged by CEM. CEM might have received instructions for Chinese text in April 1998, but that should be the responsibility of Guardforce and not AA. CEM had warned Guardforce that these instructions might not be completed by AOD, but Guardforce apparently did not pass on the warning to AA. Again, Guardforce was at fault. While AA should have imposed the requirement of Chinese text in the contract or have issued the instructions for the Chinese text earlier than November 1997, it would be unfair that all the blame should be attached to AA. The Commissioners feel that Guardforce should be mainly responsible.

(b) For the breakdown of the printing equipment in Kai Tak, Guardforce being the contractor to provide the software and hardware of ACS must be responsible. Similarly it must be responsible for the breakdowns caused by the failure of the server at Kai Tak. Guardforce should also be responsible for the lack of ink and paper.

(c) Guardforce should not be responsible for the two occasions of downtime which were caused by power failures or power changeovers. There is insufficient evidence for the Commission to reach a finding if AA should be responsible for these downtimes.

(d) The large number of last minute rush applications for permits by business partners of AA cannot reasonably be the responsibility of Guardforce and must be the responsibility of those business partners, and possibly AA. AA should have planned to avoid such late applications, and should not allow them to disrupt the normal permit issuing process. However, there is no sufficient evidence before the Commission for it to make a finding that AA failed to make such a plan or that the plan was not followed through by AA. So there should not fairly be a finding that AA should be responsible.

(e) The questions about ACS not having been fully tested and the amount of alarms causing disruption will be dealt with below.

(b) <u>ACS doors and other problems</u>

15.45 On the progress of testing, AA alleged that site acceptance test ("SAT") was not completed prior to AOD because the installation had not been completed. There were also problems with damaged doors by contractors' workers such that the system was not sufficiently stable for testing as well as problems with the servers when large number of permits were downloaded onto the system. W47 Morton agreed that SAT had to be stopped so that a software development fix to the queuing problem (Tuxedo version 6.4) with the head end computers could be loaded on the system. It is clear from the evidence that ACS was not complete as at AOD. The deactivation of all airbridge doors after AOD showed that ACS was not able to perform its verification of permit function and the monitoring function.

15.46 Guardforce alleged that model tests were delayed because AA had failed to make available the General Building Management System ("GBMS") and Building Systems Integration ("BSI"). Guardforce also alleged that the slippage of the programme was primarily due to the late issuance of various instructions by AA, damage to Guardforce's installed works by third parties and late completion of work by other contractors. On the delay in the production of permits, Guardforce put forward AA's late issuance of instructions outside its scope of contract and the system downtime as the contributing reasons. These instructions are as follows:

(a) In October 1997, Guardforce received AA's instructions to design and install a temporary system at Kai Tak for the production of security permits. CEM was instructed to design the necessary software and systems.

(b) In November 1997, AA gave instructions to include Chinese text in the permits. This question has been dealt with under "delay in permit production" above and will not be repeated here.

(c) On 2 June 1998, Guardforce received AA's third instructions to provide software and support to transfer data from the temporary permit system at Kai Tak to ACS at the new airport. Guardforce immediately instructed CEM to develop the software.

(d) In June 1998, AA issued further instructions to Guardforce to increase the size of the permit system by providing five additional computer terminals complete with installation, software configuration and with additional printers.

15.47 AA alleged that the temporary system was required because the permanent system, which Guardforce was to set up, was unavailable at the time. Guardforce disagreed and alleged that at no time were they asked to have the main system up and running before AOD. The Commissioners consider that if Guardforce had felt that these instructions were outside contract C396, they could have either refused to accept the instructions or have warned AA of the risk of disruption. However, Guardforce failed to do either. The instructions were issued as early as October 1997, some eight months before AOD. If Guardforce accepted the instructions, which it did, it must provide additional resources to complete the work without allowing it to cause difficulty or disruption to the C396 works. The Commissioners therefore find that blame should not be attached to AA in this regard.

15.48 W47 Morton agreed that the need to transfer data from Kai Tak to CLK was foreseen. The Kai Tak system was a temporary system, and so there was a need to modify the software. The instructions included taking data, which had already been transferred, to the new system and putting it into the revised software which provided the Chinese text. Under cross-examination, W47 Morton conceded that it was the instructions for the inclusion of Chinese text that increased substantially Guardforce’s work. The Chinese text problem has been dealt with earlier. The Commissioners find that it is Guardforce who should be responsible for the disruptions, if any, caused by the transfer of data from Kai Tak to CLK that it had foreseen.

15.49 W47 Morton also accepted that the instructions in June 1998 for five further computer terminals took 10 to 12 days to configure. He agreed that the order for additional printers were in April, not June 1998, and that it did not cause complications. In the premises, this matter should not reasonably be considered as a factor contributing to the ACS problems. Moreover, the added computer terminals would presumably have helped quicker production of permits and should not have been treated as a problem, in particular, if Guardforce had sufficient resources to comply with the instructions.

15.50 Another issue was raised that doors and related equipment were damaged. AA and Guardforce alleged that physical damage to doors and wrongful activation of break glass release buttons was a main contributory factor to the delays in completion of ACS contract. The act triggered alarms in the system which hampered Guardforce's ability to test and stabilise the system. Thousands of emergency break glass had to be replaced, sometimes with strong plastic to deter further breakage. The Commissioners accept these pieces of evidence. These matters certainly caused disruption to the installation and testing of ACS, but there is no evidence as to who was the culprit of the vandalism. Guardforce should not be responsible. The responsibility for the damaged doors and related equipment should clearly be assigned to those people who committed such irresponsible acts of vandalism. Those people cannot be identified as AA was unable to catch any.
On the other hand, it may be said that AA did not provide a secure and safe place for Guardforce to carry out its works and have its works preserved when completed. However, there is evidence that AA did use a lot of efforts to prevent vandalism, for instance:

(a) The problem of vandalism was recognised by AA as early as November 1997 and steps were taken in conjunction with British-Chinese-Japanese Joint Venture (“BCJ”) to guard against these acts by, inter alia, various steps listed in BCJ’s letter to the Commission dated 3 December 1998, including the procurement through BCJ of a total of 230 security staff to patrol PTB.

(b) AA gave instructions to AVSECO to attempt to apprehend the culprits causing the damage by written instructions dated respectively 20 May, 29 May, 5 June, 12 June and 22 June 1998. Tenants of PTB were aware that heavy penalties might be imposed on those who broke the rules, including the prohibition against using unauthorised doors for access.

(c) AA issued instructions to contractors on 1 April 1998 advising the implementation of the Interim Security Measures, which clearly stated that access to and egress from PTB were limited to specific control points with security guards on duty.

(d) AA also instructed Guardforce to provide guards for the communications rooms for the period from July 1997 through to June 1998.

15.51 Notwithstanding these steps, it was virtually impossible to catch the offenders. The Commissioners feel that it may be unreasonable to find AA responsible for not having taken sufficient steps to prevent vandalism.

15.52 There are other problems that caused disruption to the works on ACS:

(a) W47 Morton agreed that in some cases, Guardforce had incorrectly installed its apparatus although he maintained that this would not have affected the operation of ACS. Guardforce should be responsible for these errors.

(b) W47 Morton alleged that half of the problems with the airbridges were to do with the door holders and door closing magnets, which were not within the scope of work of Guardforce. BCJ was contracted to provide for the door holders. On the other hand, BCJ had attributed the problems with the door holders to changes in the AA's design intent.

(c) On the issue of late completion of works by other contractors, Guardforce alleged that they had to wait for repairs by third parties to door lockings, hinges and other mechanical items. Nevertheless, W47 Morton later accepted that the delays in such work was not as serious as previously suggested.

(d) Some alarms were set off due to operational errors. It was said that operators selected “staff” rather than “passenger” mode such that the door alarm sounded when the door was held open for too long.

15.53 Other than physical damage to ACS doors, AA attributed the causes of the major outstanding problems on AOD to software problems with ACS and generally to the lack of resources on the part of Guardforce or CEM to complete the works on time. Guardforce accepted that there were various software problems, such as the queuing problem with the head end system where the system could not handle the backlog of data. There was a server concentrator problem which took the Distributed Access Controllers (“DACs”) offline for one or two minutes or an hour. There was also a stability problem with the head end systems although this together with the queuing problem and the server concentrator problem did not seriously affect the overall satisfactory operation of ACS. W47 Morton admitted that Guardforce was responsible for the software problem although he alleged that it was minor in nature and that large amount of damage to their installed work, the late instructions from AA and the late completion of other work had contributed to the difficulties of Guardforce in finalising the software and in completing the testing. Guardforce also admitted that it was responsible for the queuing problem with the head end computers which was subsequently resolved by loading a software fix (Tuxedo version 6.4) onto the system. For these software problems, the responsibility is squarely on Guardforce.

15.54 W47 Morton also accepted that there were difficulties in downloading the data to the DACs. Problems arose on AOD when the system had to deal with some 40,000 permits being downloaded in a single tranche. Guardforce experienced difficulties in getting the network up and running and the data downloaded to the DACs. W47 Morton said the problem was not so much that the data had to be downloaded in one tranche, but that the data was not consistent across all the 200 DACs at the airport. Some DACs might have between 2 to100 cards missing. He said he would have advised AA to download it in smaller tranches if there had been time. It was AA's choice to download in one single tranche. He agreed however that there was less chance of losing data if the downloading was in one tranche.

15.55 Guardforce was able to successfully download data of more than 35,000 permit holders to every DAC only on 15 July 1998 and the downloading problem was not resolved until the end of September 1998. Guardforce alleged that the problem with data downloading was caused by the numerous alarms of 8,000 to 12,000 a day, which took priority over downloading information.

15.56 Subject to the observations in paragraph 15.59 below, the Commissioners find that Guardforce should be responsible for the downloading problems.

15.57 On the lack of resources, W47 Morton accepted that one of the problems Guardforce faced was a lack of resources on the part of CEM and accepted the complaints as to CEM's lack of staff were legitimate. AA alleged that Guardforce was under a contractual obligation to ensure that there were sufficient resources to complete the contract before AOD. CEM denied the allegation and attributed the problem to the late instructions from Guardforce. In the opinion of the Commissioners, Guardforce should not shirk responsibility for the inadequate resources that it had in performing contract C396. The lack of resources had been raised by AA with Guardforce:

(a) At a meeting on 15 May 1998, between AA's staff W43 Mr Douglas Edwin Oakervee, Project Director, W25 Mr TSUI King Cheong, Project Manager – Electrical & Mechanical Works and others and Mr Ted Devereux (the Chief Executive Officer ("CEO") of Guardforce) and W47 Morton of Guardforce, AA raised concern as to the lack of progress of C396.

(b) AA's complaints as to CEM's lack of resources were reflected in letters from AA to Guardforce, one of 6 May 1998 and another one of 10 November 1998.

15.58 Even as late as 30 November 1998, only 60% of SAT had been completed. The Commissioners find that Guardforce and CEM probably had resources problems, and they should be responsible therefor respectively.

15.59 Although the major portion of the responsibility must be Guardforce's, the Commissioners have the following observations:

(a) AA's instructions would not have caused serious delays in the C396 contract works. However, they must have caused some hindrance to Guardforce's work.

(b) The late application for permits by the business partners of AA did cause added difficulty to ACS.

(c) Guardforce was hampered by the delay in completing and repairing the mechanical parts of the doors of ACS. According to BCJ, the problems with the defective door holders were attributable to the design changes of AA. The fact that Guardforce was awarded extensions of time would indicate that it was affected by such delay.

(d) Guardforce was disrupted in its work by the damage to its equipment caused by other contractors in PTB. Perhaps, had the system not been loaded with so many alarms, Guardforce would have been able to detect software problems before AOD. For those alarms that were set off due to operational errors, it is not clear from the evidence whether these were caused by lack of training of the staff by AA or the airlines or whether they were caused by the operators' own faults.

(e) Some delay was also caused by AA, which did not provide in time GBMS and BSI for the purposes of the model tests of ACS, for which AA should be responsible.

(f) Guardforce should not be responsible for the disruptions and delays due to the unfinished state of the construction works and the damage to the works. AA, as the overall coordinator of the works, should bear some responsibility for the delay in the construction, which meant that Guardforce could not carry out its work on a system where fitting out had finished and vandalism was not so rampant.

(g) AA should have recognised that there would be problems with opening doors on AOD and should have assigned staff to be ready with keys and other means of opening locked doors. This would have avoided the incidents of passengers being trapped, although the incidents were more an inconvenience than a security risk.

15.60 In the course of his evidence, W47 Morton mentioned that the works of Guardforce under C396 for the North Shore Airfield Works were damaged by another contractor working in the same area, and stated that "if you have people trespassing on that side of the airport, you would not have known." This raised concern instantaneously because security of the new airport is such an important issue. However, based on the following evidence, the Commissioners do not accept that there is a security risk as adumbrated by W47 Morton:

(a) The works being undertaken by Guardforce relate to a construction site outside the present operational boundary of the airport;

(b) The area where the works are being carried out is the north of the second runway site on CLK island;

(c) Behind the line of the works and to the south of the works is a separate fence between the construction phase of the works and the operational part of the airport; and

(d) That fence is patrolled by AVSECO security staff under the enhanced security arrangements in place since 13 June 1998 and with the knowledge and approval of the Civil Aviation Department ("CAD").

[28] Airside Security Risks [see also paras 8.29 and 12.87-12.101]

(a) Delayed entry of police motorcycles into restricted area

15.61 AVSECO maintained that this incident was an isolated one with no security risk involved. According to them, their procedures in dealing with emergency service vehicles responding to an emergency are clear. Those with their siren or flashing lights turned on to indicate the urgent nature of their duties would be given immediate access. In this incident, misunderstanding might have arisen as the siren and flashing lights of the police motorcycles were not on. The Commissioners feel that in ensuring prompt and effective response to an emergency, there should be no room for misunderstanding among the parties involved of what the correct procedure is. In this particular incident, either there was ambiguity in AVSECO's procedures, or there had been a failure of communication between AA and the Police. The Commissioners are glad to learn that the relevant procedures have been fine tuned after the incident, and that the revised procedures have worked well.

(b) <u>Transit passengers allowed to enter Departures Hall and board flight without security check</u>

15.62 Both the Hong Kong Aviation Security Programme (“HKASP”) and the Hong Kong International Airport–Airport Security Programme (“HKIA–ASP”) clearly require airline operators to ensure security screening of their transit passengers. In this incident, China Airlines Ltd. (“CAL”) clearly breached the security procedure which requires transit passengers to be security screened before proceeding to departure. CAL admitted this breach and apologised for it.

15.63 The Commissioners opine that CAL should also be faulted for its failure to stop the flight in time to carry out remedial security screening, resulting in the recall of the aircraft after it took off. CAL argued that this was due to late instructions from AVSECO. They said AVSECO did not give CAL a clear decision on what remedial measure should be undertaken.

15.64 At first, the Duty Manager of CAL was only requested to submit a written report on the incident. It was only at a later stage that AVSECO was unequivocal about the need to recall all the transit passengers for security screening. AVSECO however maintained that their staff had made prompt and concerted effort to rectify the situation by requesting CAL ground staff to recall passengers for security screening, but the latter adopted an uncooperative attitude. Despite obtaining verbal undertaking eventually from CAL that the aircraft would be held up pending the off-loading and screening of the passengers, the AVSECO Duty Security Manager noticed that the aircraft was being pushed back. He therefore immediately requested the Air Traffic Control Centre (“ATCC”) through AOCC to recall the aircraft. On balance, the Commissioners prefer AVSECO’s evidence in this respect over CAL’s.

15.65 CAL further argued that they should not be the only party to be blamed since at the time of the incident :-

(a) ACS at boarding gate 23 did not function. Had ACS been operative, there would have been an effective barrier to prohibit entry to Level 6; and

(b) the AVSECO guard stationed at the airbridge did not stop the transit passengers from proceeding to Level 6.

On (a), Guardforce did not accept that they were responsible for the incident because they were responsible for installing the ACS, but not for the day to day operation of the system. On (b), AVSECO explained that due to difficulties with ACS, a security guard was positioned at the door (which was not locked) inside the airbridge at gate 23 connecting Arrivals Level 5 with Departures Level 6 to prevent unauthorised access from the Arrivals to the Departures levels. A tensa barrier was also placed across the airbridge passage connecting Levels 5 and 6. When the AVSECO guard saw CAL ground staff leading the transit passengers towards the door to Level 6, he directed them to proceed to Level 5. CAL staff however ignored him and began to dismantle the tensa barrier. The supervisor of the guard on duty went to assist but could not stop the flow either. According to AVSECO, the guards quite rightly refrained from the use of force, which would be undesirable and also would have had a potentially disastrous effect in the confined space of the airbridge. AA concluded that the guards had done all they could to stop the passengers from proceeding to Level 6.

15.66 The Commissioners' views on Guardforce's role and responsibility in the malfunctioning ACS are set out under item [27] above. On the performance of the guards in question, the Commissioners accept the argument by AVSECO that the tasks of the guards are mainly to prevent breach of security by unauthorised persons not familiar with the HKASP and HKIA–ASP requirements, rather than by properly authorised airline staff who decided to pay little regard to the security requirements. The Commissioners also acknowledge that the guards were outnumbered by the transit passengers. Despite these points, the Commissioners are disappointed with the fact that the two guards failed to intervene effectively to stop the CAL staff and transit passengers. This is after all a situation posing serious security risk to the airport. The guards should have adopted a more robust approach by, for example, asking for immediate help from more guards and/or the top management to intervene. This incident highlights the importance of ACS to the security of the airport. Had the ACS door not malfunctioned and been locked, the incident, with the resultant security risk, would probably not have occurred.

(c) Unauthorised access to Airport Restricted Area ("ARA")

15.67 The Commissioners agree generally to the analysis of Mr Sidney CHAU, General Manager of AVSECO about the causes of the 55 cases of unauthorised entry, and are glad that the number of cases has dropped to an insignificant level three months after AOD. Nevertheless, the Commissioners believe it is necessary to hold AVSECO responsible for the failure to prevent the 55 cases of unauthorised entry into ARA in the first place, and AA for not putting up sufficient signage to indicate boundaries of ARA. Some holders of permits of ARA are also responsible for inappropriate use of such permits, resulting in unauthorised entry.

(d) A KLM flight took off with baggage of two passengers who were not on board

17.68 The incident was investigated thoroughly by CAD. According to the investigation report, the boarding process of KLM involved the comparison of information from the boarding gate reader ("BGR") with that in the Departure Control System ("DCS") from the check-in counter to check the number of passengers boarded and identify any missing passenger. There was no linkage between the software of the BGR system and that of DCS used by KLM which meant that the boarding process was not fully automatic. The agent obtained the number of passengers checked in at the time from DCS and input it to BGR to set the control limit. This figure needs to be updated until the check-in counter is closed. Upon boarding, the boarding pass ("BP") will be screened through BGR and the number of passengers boarded will be compared with the control limit to determine whether all passengers have boarded. The BP number of any missing passenger will be shown in the BGR system. The agent will key in this number to DCS to trace the passenger's name for paging. In this particular case, the agent was unable to update the control limit. As a result, the boarding process was disturbed. It could not be established whether it was a human error or the malfunctioning of the BGR system at the time.

15.69 KLM was found by CAD to be in breach of the requirements of the HKASP for airlines to ensure that where a passenger has checked in baggage for a flight and does not board the aircraft, his baggage is removed from the aircraft before its departure. However, there is no material security implication in this case because :

(a) all checked baggage of the flight was x-ray screened before being loaded on the aircraft; and

(b) the two passengers showed up at the boarding gate when the flight was about to take off. They had no intention of not boarding the aircraft.

15.70 The requirement in the HKASP for airlines to remove the baggage of a passenger who does not board the aircraft is an additional safeguard for passengers' safety. All passenger baggage is security screened to comply with the international standard.

15.71 The Commissioners concur fully with the result of CAD's investigation. They are satisfied that this is an isolated case of failure to comply with the HKASP requirement on passenger and baggage reconciliation caused by human error, for which KLM should be responsible.

[29]<u>Congestion of Vehicular Traffic and Passenger Traffic</u> [see also paras 8.30 and 12.102-12.109]

15.72 The Transport Department is responsible for approval of design, and monitoring of the operations of the transport facilities. Citybus Limited and Long Win Co Ltd, the franchised bus companies, as well as AA claimed that the huge and overwhelming number of sightseers was not foreseeable. AA also alleged that it could not control the number of buses or the number of visitors coming to the airport.

15.73 The relocation of the new airport was much publicised before AOD and the public was eager to see the new airport. Accordingly, it must be foreseeable that "curiosity visitors" would visit the airport on AOD and the days thereafter. It appears that the parties concerned, in particular, the Transport Department, did not make sufficient planning relating to the traffic on Cheong Tat Road. From the effectiveness of the remedial measures taken from 11 July 1998, such as reducing the number of buses going via Cheong Tat Road, and segregating shuttle buses and external buses to use different bus stops, such measures could have been put in place before AOD, had there been better traffic planning by the Transport Department.

15.74 Those people who were not travelling passengers, were expected to take the 'E' and 'S' buses which stopped at Cheong Tat Road. If the passenger lifts at the nearby carparks and the escalators were put into service on AOD and if temporary signs were put in place to avoid confusion of passengers getting into PTB via the down ramp, the crowding problem could have been alleviated. In this respect, AA should be responsible.

[30]<u>Insufficient Air-conditioning in PTB</u> [see also paras 8.31 and 12.110-12.133]

15.75 The Commissioners will deal with the issues in respect of the PTB area first before those relating to the tenant areas. There are altogether 12 incidents in which air-conditioning in PTB was affected. Each of the incidents will be dealt with separately.

(a) <u>In PTB</u>

15.76 (1) *6 July 1998* Carrier Hong Kong Limited ("Carrier") admitted that they were responsible for the low refrigerant pressure switch fault, which caused chiller No.5 to trip. One of the Commission's experts, W54 Professor Xiren CAO however stated in his report that this type of problem might be considered as normal. Furthermore, Carrier alleged that this should not have caused the problem on AOD as it was a self-contained situation which did not affect the remainder of the system. It alleged that the real problem was the shutdown and inability to restart the chillers due to the loss or reduction in sea water flow. Young's Engineering Company Limited ("Young's") admitted that they were responsible for the flow switch fault, which caused pump No.2 to trip. W54 Cao also stated that that this type of problem might be considered as normal. On the issue of communication between the chiller plant and the pump house control systems, AEH Joint Venture ("AEH") stated that this is carried out via the bypass controller, over which AEH has control of its functioning. AEH also stated that a pump did start, a signal was given and increased seawater flow was observed for a short time but shortly after the pump tripped due to a faulty flow switch in the seawater pump house. The seawater pump house control system is the responsibility of Young's. Young's denied this allegation and stated its system did not give a signal that any additional pumping had started up for chiller No.4 and that AEH's bypass valve was supposed to have a logic that prevented it from modulating until such a signal was given by Young's control system. Without examining the system in detail, the Commissioners are not in a position to come to any view on which party should be responsible.

15.77 Young's confirmed that the logic (for which it is responsible) did try to start a faulty pump (Pump No.2) which seems to suggest that there was problem with the control logic. The inefficient oral communication between the pump house control room (for which Young's is responsible) and the chiller rooms (for which AEH is responsible) was caused by the poor reception of the mobile phone. According to Young's, contact through land telephone line was hampered by the fact that the telephone could not be heard due to a fire alarm test being conducted at the time.

15.78 Interface testing between the pumps and chillers were conducted between 12 and 30 June 1997, well before AOD. However, the testing and commissioning had revealed the inability of the seawater system to control and balance the seawater flow provided by the pumps to match the needs of the chillers. In September 1997, a remedy was devised but the order for the necessary equipment was not made until December 1997. Delivery and installation took five months mostly due to the time it took to acquire the valve actuators. Testing of the system did not take place until 12 June 1998. The timing was dictated by AA as the testing would potentially involve a complete shutdown of the chillers.

Further improvement was still required and AA asked Mott MacDonald Limited to carry out a further review which was not completed until September 1998. The late timing of the testing meant that Young's was not provided sufficient opportunities to test the logic of the control system nor did it get to test scenarios of tripping during the June tests. AA alleged that AEH had failed to submit complete documentation to complete the commissioning stage and had failed to carry out sufficient testing of the chillers. AEH denied this and submitted that the chillers were operating 24 hours a day, 7 days a week between September 1997 and 5 July 1998 and had performed reliably. On the evidence, and without cross-examining the relevant witnesses on the allegations, the Commission simply cannot decide.

15.79 Nonetheless, in the Commissioners' opinion, it appears that the problem on 6 July 1998 was one of interfacing between Young's seawater pumps and AEH's chillers. AA should bear the responsibility for failing to coordinate and organise sufficient interface testing between the systems of Young's and AEH.

15.80 (2) *10 July 1998* Young's admitted that the tripping of the seawater pump was due to the error of one of its pump operators. It is therefore clear that Young's must be responsible.

15.81 (3) *12 July 1998* AEH admitted that it was responsible for the sudden energisation of a main chilled water branch, which could have been avoided if it opened the valves slowly.

15.82 (4) *13 July 1998* Whilst lightning strike had caused the chillers to trip, Young's admitted that there was a small error in the control logic, which was due to a missed line from the software programme. This accordingly should be Young's responsibility.

15.83 (5) *28 August 1998* This incident was caused by lightning strike affecting power supply to the chillers. AA alleged that since the incident in (4) above, to avoid fluctuation or loss in power supply, "uninterrupted power supply" units ("UPS units") had been installed between 28 September 1998 and 27 October 1998 to the chiller control panels and the panel serving the seawater controls in the chiller plant.

However, the instructions were issued by AA on 17 July 1998, some six weeks before the incident on 28 August 1998. Had AA issued instructions for the installation of UPS units or had them completed earlier, or had other precautionary measures taken much earlier, this incident and the other lightning incidents referred to in items (4) above and (7) below might have been avoided. The Commissioners find that AA should bear some responsibility for the late instructions.

15.84 (6) *29 August 1998* Although Young's alleged that the loss of power was not within its control, it should be responsible for ensuring that the electrical protection setting was set correctly.

15.85 (7) *30 August 1998* This incident could have been avoided had AA organised for UPS units to be installed or taken other precautionary measures much earlier. The comments under item (5) apply here.

15.86 (8) *8 September 1998* Young's admitted that it was responsible to the extent that the system was vulnerable due to critical control circuits not being on a dedicated supply.

15.87 (9) *14 September 1998* This was a single incident of human error to which no responsibility should be assigned except to the person who committed the error. If that person was an employee of the contractor for the Mechanical Building Management System, then that contractor should, in the opinion of the Commissioners, be responsible.

15.88 (10) *12 October 1998* The damage to China Light & Power Company Limited's ("CLP's") underground cable was caused by a third party contractor which has not been identified.

15.89 (11) *22 October 1998* As this was a planned shutdown, no one should be responsible.

15.90 (12) *28 November 1998* There is inconclusive evidence as to who should bear responsibility for this incident. It may be that AEH, as the contractor who is responsible for the installation of the UPS units, should have correctly set the UPS unit in the appropriate mode of operation. Young's alleged that the unauthorised isolation of power supply was due to the failure of Airport Management Division ("AMD") to provide more stringent access controls to the seawater pump house. AA contended that it had not decided to implement "more stringent methods of access control" as the cause of the incident was not known and that if the current monitoring exercise identified a cause, appropriate action would be taken.

(b) <u>In tenant areas</u>

15.91 Much of the responsibility for this problem should lie with tenants themselves. Late applications for the connection to AA's chilled water supply and non-compliance with the procedure for this connection by tenants led to a large volume of requests for connection in the few days immediately prior to AOD. As a consequence AEH was unable to respond within the usual time frame. The Commissioners do not think such tenants should or should be in a position to complain about the late supply of air conditioning to their premises. The Commissioners are not able to find sufficient evidence to [hold AA responsible] for not having had a closer coordination with the tenants or a more effective management over the tenants in this respect.

[31] <u>PA Malfunctioning</u> [see also paras 8.32 and 12.134-12.166]

15.92 As described in Chapter12, there were hardware and software problems with PA. The responsibility for the software problems will be dealt with first. For the Central PA, the problems with the stability of the manual all zone ("MAZ") notebook and the locking up and latching were the most serious. Most software problems were caused by the required tests not being performed by AOD. For example, the intelligibility problem could have been eradicated had there been a Rapid Assessment of Speech Transmission Index ("RASTI") test for assessing the rapid speech intelligibility index of the actual sound of PA. But this test could only be usefully and meaningfully done after PTB was completed with acoustic related materials, and such materials had not been installed prior to AOD. The result was that AA and Hepburn Systems Limited ("Hepburn") agreed that RASTI tests should be deferred after AOD. This should not be considered as a fault of AA or Hepburn.

PTB was not completed in such a way as to usefully have the tests, and that was caused by the various slippages of the construction works. There is no evidence to show that the slippages were the fault of AA as opposed to the various contractors who were responsible for various pieces of works to build PTB. For this reason, the Commissioners are not prepared to hold either AA or Hepburn responsible for the problem of intelligibility of PA.

15.93 The zoning and priority problems only required minor and quick adjustments to be made, and they alone can be considered to be minor and teething problems. Again these problems could have been uncovered and remedied had there been more tests and trials with airlines that were going to use the PA. Based on the evidence that Hepburn delayed in its work on PA, Hepburn should be primarily responsible.

15.94 The slow response time of the consoles that inconvenience the users, being a software problem, must be the responsibility of Hepburn.

15.95 Similarly, the overriding problem, which is a one-off incident, was a matter of software for which Hepburn should be responsible.

15.96 There were different allegations by Hepburn and AA over the MAZ console outages on AOD which prevented the Central PA from functioning. MAZ notebook outage, as alleged by Hepburn, originated from the earthing problems of the communications rooms. The earth lines between the rooms were electrically "noisy" and were interfering with the data communication between the control room and the MAZ notebook. W47 Morton of Hepburn agreed, however, that he had no documentary evidence to support the claim of electrical interference and that the possibility of a noisy earth link was more like a deduction than an actual finding.

15.97 Hepburn's allegation was denied by AA. AEH, the power supply contractor, stated that it had no record and no recollection of AEH being asked after AOD to investigate specific problem with power supplies to the PA equipment and that no rectification work had ever been done.

15.98 AA claimed that the MAZ outage was mainly a software problem. Inadequate testing, insufficient resource and fire alarm latching problem were the causes.

15.99 The locking up or latching problem was apparently not related to the fire alarm system itself. The Fire Services Department ("FSD") used the Audio and Visual Advisory System ("AVAS") which provided audio/visual indication of safe direction of egress from the area affected by fire. AVAS has an interface with PA. FSD had conducted extensive inspections on the AVAS since October 1997. A final inspection was conducted on 26 June 1998 and the result was found satisfactory.

15.100 AA alleged that the locking problem was not just a one-off manifestation of the problems with PA but rather the cause of all the failures of the Central PA. Hepburn denied that. W47 Morton said the locking problem did not appear until late July and in any event did not stop PA from operating. According to Hepburn, the system was putting out about 270 calls per day from AOD. W47 Morton conceded, however, that the locking problem was caused by a software problem to which Hepburn was responsible. In the cross-examination of W47 Morton by AA, it would appear from an internal e-mail of AA dated 28 June 1998 from Mr Peter W H WONG, Senior Design Engineer, to Mr Alastair Blois-Brooke, Senior Construction Manager, and copied to W25 Tsui of AA that Hepburn and SigNET (AC) Limited ("SigNET") were aware of the locking problem prior to AOD.

15.101 Despite the conflicting allegations, the Commissioners are of the view that the system instability problems and those relating to locking and latching causing console outages, being software problems as accepted by W47 Morton, should be the responsibility of Hepburn. These problems on the evidence were not probably caused by the 'noisy' earth lines.

15.102 The hardware problems tended to be more localised. As far as the physical damage to the membranes and gooseneck microphones are concerned, Hepburn alleged that AA should ensure that PTB was a secure area in the period leading up to AOD. AA however maintained that the activities described could only been the result of random and gratuitous vandalism by unknown persons, and submitted that the responsibility for such damage must rest primarily with the persons who inflicted it on the local consoles. The Commissioners do not fully agree. While the damage might have been caused by vandalism, and the vandals must be responsible in such a case, operators could have carelessly inflicted the damage, such as using a ball-pen to poke at the membrane. The Commissioners think that AA should send an advice and warning to all users and possible users on how to use the consoles properly, so that unknowing damage of this kind can be prevented.

15.103 Hepburn also alleged that AA should be responsible for the incomplete installation of some PA equipment. AA admitted that the ambient noise-operated amplifier facility was not installed prior to AOD although it claimed that the absence of this facility did not prevent the operation of PA. This goes back to the lack of time and PTB not being absolutely ready for the installation of PA equipment, referred to in paragraph 12.141 of Chapter 12 above.

15.104 AA alleged that Hepburn failed to ensure the completion of the testing and commissioning of PA before AOD. Hepburn argued that over a number of months before AOD, it had been agreed between Hepburn and AA that SAT would be carried out after AOD (but no time or date was fixed). In addition, the conditions for SAT to take place did not exist prior to AOD and BSI and the Voice Routing System (“VRS”) were only available at the end of October 1998. Hepburn alleged that SAT could not be carried out without BSI and VRS being available. However during cross-examination, W47 Morton qualified the above statement by saying that, while RASTIs were agreed to be postponed until after AOD, those would not constitute the majority of SAT testing. W47 Morton admitted that they had problems with a Hong Kong sub-contractor, Univision Engineering Limited, and Hepburn had to change the sub-contractor and it affected the development of an interface software to BSI. AA alleged that this problem resulted in a delay of factory acceptance test (“FAT”) which was only completed at the end of June 1998. Indeed, SATs, including the RASTI testing, were only completed at the end of October 1998.

15.105 Complaints were made against Hepburn and SigNET for lack of resources and shortage of specialist engineers thereby creating delay and resulting in insufficient testing. As reported in AA Board Paper 194/98 dated 14 July 1998, the confidence level of AA's Management in Hepburn was low and consideration was given to appoint another contractor to install an alternative Local PA. On the other hand, AA was accused of frequent change of instructions and poor coordination.

15.106 Hepburn denied AA's allegation that it was under-resourced but W47 Morton of Hepburn later admitted that on two occasions, software specialists were not available even upon the request of AA.

15.107 SigNET, the subcontractor, denied that resource was ever withheld from the project or that maximum resource was not applied at all times in accordance with the needs of the project. SigNET, however, admitted that it is a small company with finite limits to some areas of expertise. SigNET entered the project at a relatively late stage and it had to contend with frustration due to late responses from Hepburn or AA, frequent changes of priorities and instructions, and insufficient support from Hepburn. Due to the specialist knowledge and experience required, it was impossible for SigNET to expand quickly to meet the requirements with all these additional constraints.

15.108 From the evidence, the Commissioners find that while a small part of the delay in the commissioning and testing of PA could have been caused by the late readiness of PTB, the major delay was caused by Hepburn in failing to keep the contractual deadlines. There might have been frequent changes of instructions given by AA to Hepburn, but that should normally have been covered by extensions of time granted. Hepburn was awarded an extension of time, but even with the extension, the revised completion date for the system was 15 April 1998. The delay can be easily appreciated when SATs were only completed in late October 1998, long after AOD. The main reason seems to be the inadequate resources that Hepburn and its subcontractor SigNET had assigned to the contract. For the delays and inadequate resources, Hepburn and SigNET should be responsible.

15.109 There is no evidence that the problems with PA caused passengers to miss their flights. However, the general picture is that the PA problems added to the confusion on AOD, contributing to the impression that the new airport was not ready for opening.

15.110 CSE International Ltd ("CSE"), AA's consultants on systems, had repeatedly flagged up problems in the development of the PA. For instance, in its software evaluation report of 26/3/98 it had pointed out that the delivery of the remaining SigNET software and formal onsite testing continued to slip. AA knew PA would not be completed or completely tested before AOD, and W44 Mr Chern Heed, Airport Management Director of AA, admitted in evidence that prior to AOD, he knew that PA had not gone through SATs and that there were problems with the Local PA.

15.111 PA always featured with the AA management as a contingency measure in the case of FIDS failure. It would be used as a backup for the dissemination of information in such a case. However, W44 Heed admitted that he had not considered the problems of disseminating gate change information in the case of a FIDS failure and a full apron, not thinking that this situation would arise. He agreed that if PA failed at that time there would be problems. He had not planned for the possibility that PA (for making central announcements) might not work at the same time that FIDS did not work. This failure of overall contingency planning is dealt with in Chapter 17.

[32]<u>Insufficient Staff Canteens</u> [see also paras 8.33 and 12.167-12.173]

15.112 The problem of insufficient staff catering facilities does not impact on the operations of the new airport directly. However, since a large number of people working at the new airport are affected, the Commissioners classify it as a moderate problem.

15.113 The Commissioners consider that AA should be criticised for its poor planning of staff catering facilities. There does not seem to have been a scientific and realistic assessment of the requirements taking into account the number of staff working there. In his expert report, W51 Mr Jason G YUEN, expert for the Commission, opines that the planning ratio of 19 to 1, assuming 15,000 people (14,600 actual) as against 800 (since mid-October 1998, 954) seats in staff canteens, appeared to be very low. Though some members of the people working in the airport might bring their own food or might go out to Tung Chung for their meal, still the ratio of persons to a seat being 15 to 1 (14,600 persons to 954 seats) appears high. One would have to remember that if staff do not bring their own food, a trip from the new airport to nearby Tung Chung and back on bus will take sometime, causing some inconvenience to the staff.

15.114 While the Commissioners have not found relevant evidence to determine if the planning ratio is reasonable or not, the fact that more catering capacity was once planned by AA at some stage but was somehow dropped due to unknown reasons goes some way to reinforce the suspicion that the existing provisions might not be adequate. Even if the total capacity of the existing four staff canteens is sufficient to cater for the actual daily needs, AA should be responsible for not having been able to ensure that all the four planned canteens could open for business on AOD. This is particularly so since the large number of sightseers on AOD is certainly something which should have reasonably been envisaged. When all kinds of problems surfaced on AOD, the inadequacy of staff canteens would certainly have caused difficulty to the staff of the airport community who were already exasperated with the chaotic conditions.

[33] Radio Frequency Interference on Air Traffic Control Frequency
[see also paras 8.34 and 12.174-12.178]

15.115 On the basis of the information provided to the Commission, the Commissioners find that both the Hong Kong and Mainland authorities attach great importance to flight safety and strenuous efforts are being made with a view to eliminating radio frequency interference completely. No finding is therefore called for in respect of this problem.

[34] APA Malfunctioning: a Cathay Pacific Aircraft was Damaged when Hitting a Passenger Jetway during Parking on 15 July 1998

[see also paras 8.35 and 12.179-12.190]

15.116 Generally, on the causes of the malfunctioning of APA, there were crossed allegations between AA and Safegate International AB ("Safegate"). Judging from the evidence, and in particular having regard to the fact that Safegate had to take some remedial measures towards APAs in the new airport after AOD, the Commissioners come to the view that Safegate should be responsible for these general causes.

15.117 In respect of the accident on 15 July 1998, AA and Cathay Pacific both alleged that it was caused by the malfunctioning of the particular APA. This was denied by Safegate who said that the APA system was at that time still being tested. Safegate, however, accepted that the auto-calibration system of the particular APA had been inadvertently disabled by its staff. As a result, the problem with the inoperative laser sensor was not identified in the auto-calibration process. This is the root cause of the accident. First, the laser sensor was not working. Secondly, the auto-calibration process could have revealed the sensor fault and warned the air pilot, but this checking process had been disabled by a Safegate staff during testing who apparently forgot to re-activate it after testing. Safegate should be responsible.

15.118 The air marshall was too far away from the operator panel to switch on a signal on the APA to show the pilot to stop. He was in a dilemma, because it would take him some time to reach the operator panel, when the aircraft was still moving forward. He chose to make a hand signal to the pilot to halt.

15.119 On the location of the operator panel, Safegate said it had previously advised AA to install the panel within reach of the air marshall. AA denied this but agreed that the control panel should be repositioned. It appears from this allegation that it was contractually a matter for Safegate to advise. However, there is insufficient evidence before the Commission for it to reach a conclusion whether Safegate had the duty and if so, whether it had in fact advised AA, or whether AA ignored the advice, or whether AA should have made a correct decision even without any advice from Safegate. On this matter, the Commissioners can make no decision. The happy news is that AA agrees that the control panel should be repositioned, obviously to enable the air marshall to make use of it even while he is standing on the ramp manually directing aircraft parking.

15.120 It was alleged by AA that the pilot was also suspected of not being familiar with the docking routine of how APA operates. He allegedly misinterpreted the floating arrow signals of the APA and the "emergency stop" marshalling signal as "move ahead" signal, such that he continued to taxi forward until overshooting the stop bar by six metres. Similar allegation was made by Safegate against the pilot.

15.121 Cathay Pacific responded by alleging that the air marshall and the pilot were both victims of a degraded, deceptive and poorly configured guidance system. It further alleged that the stop signal might not have been properly given by the air marshall as it was a rather frantic attempt by him to intervene once he realised the APA was not working. The pilot's evidence was that the air marshall arrived from a position below the right hand side of the aircraft very shortly before the aircraft stopped, which was estimated to be 1.5 metres prior to coming to stop. AA had a different version of this. It alleged that the air marshall gave the emergency stop signal when the aircraft was about 12 metres away from final stop position.

15.122 Cathay Pacific admitted that the pilot had no experience with parking at a frontal stand at the new airport as in this case. With the difference in perspective between a remote stand, being very close to the bay number board, and a frontal stand where the terminal is further away, the pilot's perspective would be different.

15.123 Neither the pilot nor the air marshall have been summoned to give evidence before the Commission, because of time constraint. When a situation described in the allegations occurs, without the assistance of oral testimony, it is impossible to judge which version, if at all, is true. It was alleged either the air marshall was giving incorrect signals or the pilot did not have a full understanding of such hand signals. The Commissioners do not believe either allegation being probable. Both of them are experienced in their own field and had gone through rigorous training with constant refresher courses. Apart from this observation, the Commissioners do not feel they can make any other finding on the conflicting allegations as to how the accident actually occurred.

[35] <u>An Arriving Passenger Suffering from Heart Attack not being Sent to Hospital Expeditiously on 11 August 1998</u> [see also paras 8.35 and 12.191-12.193]

15.124 The Commissioners note that the cabin crew did not notify the Apron Control Centre ("ACC") or AOCC about the sick passenger on board before landing. Hence, no arrangement had been made to put an ambulance on standby on arrival of the aircraft. China Southern Airlines confirmed that ambulance service was called after the aircraft had landed. The thirteen minutes spent waiting for the ambulance to arrive could have proved critical to patients requiring immediate emergency treatment. It was fortunate that in the case in question, this did not result in a major incident. Nevertheless, the Commissioners have to hold the China Southern Airlines responsible for failing to notify the airport about the sick passenger before landing. AA informed the Commission that after this incident, airlines had been reminded that if a passenger was taken ill on an inbound flight, the flight crew should notify the airport before landing so that an ambulance can be standing-by on arrival of the aircraft at its parking stand.

15.125 Thirteen minutes is not an unreasonable response time in this particular incident. Indeed, both the ambulance and the ACC escort arrived at their destinations within their normal response time. However, the Commissioners found that if there had been better coordination and communication between Fire Services Communication Centre ("FSCC") and ACC, the response time in emergencies like this can be further cut down. In the chronology set out in paragraph 12.192 of Chapter 12, the ambulance had to wait at the apron gate for five minutes for the ACC escort vehicle to arrive. This was partly because:-

(a) FSCC contacted ACC indirectly through Airport Main Fire Station Rescue Control ("AMFSRC") for an escort. Had FSCC contacted ACC directly, the response time could have been reduced by at least one minute; and

(b) ACC was not contacted for an escort immediately upon the CLK Fire Station being alerted to the dispatch of an ambulance.

15.126 On (a), it has already been mentioned in paragraph 12.193 of Chapter 12 that arrangement is being made for a direct line between FSCC and ACC to be installed. On (b), FSD explained that this procedure was laid down because, according to FSCC standard operational procedure, a single and straightforward ambulance case should be handled by one FSCC console operator who would carry through all despatch and information dissemination action. This arrangement was considered the most effective due to the large number of emergency ambulance calls received by FSCC each day. It would help minimise possible omissions. While the Commissioners appreciate the reason for the arrangement, they suggest that FSCC should contact ACC for an escort immediately upon the Chek Lap Kok Fire Station being alerted to dispatch an ambulance. This may involve some changes to the existing mode of operation but should help achieve a better coordination between AA and FSD and even better response time in an emergency.

[36] Fire Engines Driving on the Tarmac Crossed the Path of an Arriving Aircraft on 25 August 1998 [see also paras 8.35 and 12.194-12.197]

15.127 The procedure for vehicles entering the runway is clear and unmistakable. All relevant communication equipment was functioning properly and was not a contributing factor to the incident. It was the Rescue Leader and the driver of the first fire engine who were responsible for the failure to obtain clearance from ATC before crossing the runway. They had been admonished and disciplined by FSD subsequent to the incident. The staff of the rescue appliances involved in the incident have all been warned and reminded that the airside safety driving regulations should be strictly adhered to at all times. FSD also reminded its personnel of the proper procedures for appliances to seek permission from ATC before entering the runway. The Commissioners opine that FSD had taken appropriate follow-up action on the incident.

[37] A HAS Tractor Crashed into a Light Goods Vehicle, Injuring Five Persons on 6 September 1998 [see also paras 8.35 and 12.198]

15.128 The Commissioners consider this incident of a moderate nature not only because five persons were injured but also because it was a traffic accident inside the restricted area of the new airport. It is necessary to maintain the new airport as a safe place, and traffic accidents within the restricted area may give rise to an impression to the public that the airport itself is not running safely and smoothly. The incident report of HAS found that the driver of the tractor had not followed the proper driving procedures in stopping his tractor to ensure road clearance in front when he was driving between two lines of containers. He was regarded as having failed to pay due care and attention. As a result of Police investigation into the incident, the driver was prosecuted for careless driving. The Commissioners are satisfied that HAS and the Police have investigated into the incidents thoroughly and have no further comment on the incident.

[38] Tyre Burst of United Arab Emirates Cargo Flight EK9881 and Runway Closures on 12 October 1998 [see also paras 8.35 and 12.199-12.200]

15.129 The Commissioners treat this incident as a moderate one because it led to closure of the runway on three occasions and affected a large number of flights. At the time of the incident, the relevant freighter aircraft was operating under a wet lease agreement between the United Arab Emirates and the Atlas Air, Inc (“Atlas Air”) and was fully controlled by the Atlas Air crew. Accordingly, Atlas Air has to be held responsible for the incident.

[39] Power Outage of ST1 due to the Collapse of Ceiling Suspended Bus-bars on 15 October 1998 [see also paras 8.35 and 11.15]

15.130 This matter has been dealt with in paragraph 11.15 of

Chapter 11.

CHAPTER 16

RESPONSIBILITY –
TEETHING AND MINOR PROBLEMS

Section 1 : Teething and Minor Problems

16.1 In this chapter, the Commission recapitulates what the teething and minor problems are and reviews who should be responsible for them. Details of all teething and minor problems can be found in Chapters 8 and 9. The following provides easy reference and the responsibility for each of the problems will be dealt with in turn:

[1] Mobile phone service not satisfactory: paras 8.9 and 9.2-9.8;
[2] Trunk Mobile Radio ("TMR") service not satisfactory: paras 8.9 and 9.9-9.16;
[3] Public telephones not working: paras 8.9 and 9.17-9.22;
[4] Escalators breaking down repeatedly: paras 8.10 and 9.23-9.30;
[5] Insufficient or ineffective signage: paras 8.11 and 9.31-9.35;
[6] Slippery and reflective floor: paras 8.12 and 9.36-9.39;
[7] Problems with cleanliness and refuse collection: paras 8.13 and 9.40-9.49;
[8] Automated People Mover ("APM") stoppages: paras 8.14 and 9.50-9.59;
[9] Airport Express ("AE") ticketing machine malfunctioning: paras 8.15 and 9.62-9.64;

[10] AE delays: paras 8.15, 9.60-9.61 and 9.65-9.68;
[11] Late arrival of tarmac buses: paras 8.16 and 9.69-9.74;
[12] Aircraft parking confusion: paras 8.17 and 9.75-9.78;
[13] Insufficient ramp handling services: paras 8.18 and 9.79;
[14] Airbridges malfunctioning: paras 8.19 and 9.80-9.84;
[15] No tap water in toilet rooms and tenant areas: paras 8.20 and 9.85-9.95;
[16] No flushing water in toilets: paras 8.20 and 9.85-9.95;
[17] Urinal flushing problems: paras 8.20 and 9.96-9.110;
[18] Toilets too small: paras 8.21 and 9.111-9.122;
[19] Insufficient water, electricity and staff at restaurants: paras 8.22 and 9.123-9.136;
[20] Rats found in the new airport: paras 8.23 and 9.137-9.139;
[21] Emergency services failing to attend to a worker nearly falling into a manhole while working in PTB on 12 August 1998: para 9.140;
[22] Traffic accident on 28 August 1998 involving a fire engine, resulting in five firemen being injured: para 9.141;
[23] A maintenance worker of Hong Kong Aircraft Engineering Company Limited ("HAECO") slipped on the stairs inside the cabin of a Cathay Pacific aircraft on 3 September 1998: para 9.142;
[24] A power cut occurring on 8 September 1998, trapping passengers in lifts and on the APM as well as delaying two flights: para 9.143; and
[25] Missed approach by China Eastern Airlines flight MU503 on 1 October 1998: paras 9.144.

Section 2 : Responsibility

16.2 In respect of some of the problems set out above, it is not possible to make a finding on responsibility. This is where the evidence received by the Commission does not enable the Commissioners to come to a conclusive view on the question of responsibility and because the Commissioners decided from the commencement of the inquiry that valuable time should be better used for investigating other problems whose impact on airport opening day ("AOD") was more serious. In such cases, the Commission will set out the allegations of the parties involved, and highlight the key allegations. In other cases, the problem itself may simply be an accident or fact of life for which no one should be held responsible. Nevertheless, whatever the determination on the issues is, if a determination can be reached, the Airport Authority ("AA") must be primarily responsible for the inconvenience and inefficiency suffered by airport users in the Passenger Terminal Building ("PTB") on AOD and a few days thereafter, because after all, AA has under the Airport Authority Ordinance its functions to discharge in operating the new airport and operate it in an efficient manner.

[1] Mobile Phone Service Not Satisfactory [see also paras 8.9 and 9.2-9.8]

16.3 The evidence shows that SmarTone Mobile Communications Limited ("SmarTone"), Hutchison Telecommunications (Hong Kong) Limited ("Hutchison") and Hong Kong Telecom CSL Limited ("HKT") as the mobile phone network operators did not provide an efficient or adequate mobile phone network for their users at the new airport on AOD. However, that is entirely a matter between these three operators and their own customers, with which the Commission should not be concerned. In their written submissions, all three operators relied on the unforeseen breakdown of Flight Information Display System ("FIDS") to refute their responsibility for inadequacy of network capacity. There is of course certain truth in the argument that the problem has been caused mainly by the deficiency of FIDS, the TMR systems being overloaded and the inoperation of about two-thirds of conventional public telephones planned for PTB on AOD. These and the other events resulted in a sudden upsurge in the public demand for mobile phone services. Although it might have been foreseen that there would be many sightseers visiting PTB on AOD, the Commissioners agree, after viewing the evidence, that the concatenation of the many problems facing AOD that might further increase the demand for mobile phone service was not properly foreseeable by the mobile phones operators. The Commissioners feel that it would be unfair, in the circumstances, to hold any of the three operators responsible for underestimating the required capacity of their networks. The fact that SmarTone added channels to the Common

Antenna System ("CAS") on 7 July 1998 may mean there was insufficient capacity in the CAS as a whole. This evidence is, however, insufficient to enable the Commission to come to the conclusion that the antenna system capacity is inadequate for shared use by the mobile phone network operators. SmarTone has initiated coordination with all the mobile phone operators for expansion of their equipment capacity in order to supplement existing networks.

16.4 AA should have given advance warning to the mobile phone operators of the possibility of heavy demand on the use of mobile phones in the event of FIDS failure. Such advance warning could have enabled the operators to take this into account in designing their respective network capacity and, could therefore have avoided the problem. In any case, the problem of inefficient mobile phone service was short-lived and vanished from the second day of airport operation. In terms of its own impact on airport operation, it should only be a minor problem.

[2] <u>TMR Service Not Satisfactory</u> [see also paras 8.9 and 9.9-9.16]

16.5 TMR is an important component of the communications network of the new airport and has an impact on the overall efficiency of airport operation. As with the mobile phone network, the TMR network was overloaded because of the huge demand for TMR service, which arose from the lack of flight-related information from FIDS. The Commissioners are of the opinion that the inadequate capacity of the TMR due to the unexpectedly high volume of usage was not reasonably foreseeable by TMR operators. It might be argued that the problem of TMR overloading was not a general phenomenon affecting all operators because AA did not seem to have a problem with its TMR on AOD. Apart from that, however, there is no other evidence sufficient for the Commissioners to alter their aforesaid opinion. On the evidence, therefore, both Hutchison and China Motion United Telecom Limited ("CMT") should not be held responsible for the insufficient network capacity of their TMR services on AOD.

16.6 There is evidence to suggest that the Hutchison network suffered from weak signals. Due to the delay in the completion of the antenna farm by AA, Hutchison located its main base station outside the airport perimeter in Tung Chung which resulted in weaker signal for its TMR users. This was further affected by the inoperation of the common antenna system for Hutchison and CMT TMR due to the inoperation of the link between common antenna system and the Tung Chung base station. Hutchison attributed the problem to its contractor in supplying an inappropriate connector. The Commissioners believe that the problem of weak signal could have been anticipated by Hutchison and adequate counter measures should have been provided to overcome the problem prior to AOD. Moreover, Hutchison should be primarily responsible for the failure to put in place a link between common antenna system and the Tung Chung base station for operation on AOD.

16.7 On the part of AA, the Commissioners consider that, as the operator of the airport, AA is responsible for the delay in completing the antenna farm for use by Hutchison and CMT. According to Mr Edmund SIN Wai Man, Director of Engineering of Hutchison, AA wrote to Hutchison as early as March 1997 with the idea of having an antenna farm but then advised it in February 1998 that the facility would not be ready for use until late October or even December 1998. As the provision of the antenna farm would have facilitated operational efficiency of the TMR system, AA should have taken steps to ensure that the facility was available prior to AOD. In its written submission, AA argued that there was delay because no interested parties came forward immediately when it sought business plans in late 1997. It was not until February 1998 that HKT agreed to construct and operate the antenna farm and an agreement to that effect was signed in August 1998. AA also defended its rejection of Hutchison's request to install antennae on the Cathay Pacific Catering Services building for outdoor TMR coverage on the basis that the rejection was consistent with AA's policy to have all antennae located in the antenna farms. AA had not received any further similar request from Hutchison until some time in August 1998. However, the Commissioners do not consider that these facts should in any way reduce AA's responsibility to ensure the timely completion of the antenna farms for use on AOD.

16.8 AA should have forewarned airport operators and the two TMR providers of the possible heavy demand on the use of TMR in the event of FIDS failure. As part of the contingency or workaround measures for FIDS, AA should have advised the TMR operators to take this into account in designing the TMR capacity of their respective systems.

[3] Public Telephones Not Working [see also paras 8.9 and 9.17-9.22]

16.9 Both AA and International Computers Limited ("ICL") accepted that there was delay in the completion of the cabling and jumpering work. This hampered the progress of the work of New World Telephone Limited ("NWT"), including the testing of cabling circuits and the payphone network. This resulted in about two thirds of the planned number of public telephones not being made available on AOD. As to the other operational problems with those phones that were working, such as phones not accepting coins, NWT did not deny responsibility. Nevertheless, the effect of the problem was minimal in view of the small number of phones involved.

16.10 Close to AOD, there was a saturation of the originally designed backbone cabling system which became insufficient to cope with users' demand. This resulted in the late issue by AA in May 1998 of variation and further instructions for additional cables in PTB and for tenant jumpering work. ICL alleged that the late instructions effectively doubled its work and stretched its resources. This also did not take into account the lead time needed to procure materials. AA accepted that some of the instructions were made in the last two months before AOD but contended that this was due to the late request by tenants for additional cables during that period. AA also alleged that delay was caused by the late order of materials by ICL.

16.11 ICL alleged that despite being requested to do so since November 1997, AA did not issue tenant jumpering requirements until April 1998. When it did issue these requests, they were not in the agreed form and were often made directly to staff on site. Information was therefore often duplicated or altered, causing delay to completion.

16.12 It appears to the Commissioners that the substantial increase in the volume of tenant jumpering work immediately before AOD was foreseeable. Back in November 1997, it was agreed between AA and

ICL that pre-emptive jumpering should be carried out before the end of January 1998 to reduce the expected volume of work. Once completed, the tenants' request for jumpering work could be done simply by allocating the circuits. AA alleged that ICL did not complete the work until May 1998. This adversely affected ICL's resources and timetable. AA also complained that there was a backlog of jumpering records to be updated by ICL and that this affected the progress of the work as AA had no way of knowing exactly what had been completed on site.

16.13 AA had accepted responsibility for the problems relating to cabling and jumpering vis-à-vis NWT. W25 Mr TSUI King Cheong, Project Manager E&M Works of AA, agreed that AA was responsible for the failure to provide cable connections to NWT. However, it is not clear to what extent (if any) should ICL be responsible for the cabling problem, by reason of the allegations made against it by AA. Without hearing all the witnesses from AA and ICL on this issue, it would not be possible for the Commissioners to attribute responsibility between AA and ICL. Their conflicting allegations were various and would require the detailed examination of witnesses, which the Commission could ill afford to do in the limited time available. They are matters of a contractual dispute which should only be properly resolved through arbitration or litigation.

16.14 AA also alleged that the late submission by tenants of their cabling requirements contributed to the problem. The Commissioners are of the view that the tenants should not be responsible for problems despite their late submissions. The reason is that the tenants could not reasonably have imagined that their late submissions would result in a large number of public phones not being connected. Their late submissions might reasonably result in their requirements not being satisfied in time for AOD. On the other hand, AA should be responsible for its failure to coordinate and oversee the cabling work and to ensure that prompt remedial action was taken, eg, promptly instructing a different or another contractor to help when the delay and the effect of which was foreseen. It was not until late May to June 1998 that AA instructed HKT and two other contractors to assist in the cabling and jumpering works. Alternatively, AA should have given priority to having all the public telephones installed first before catering for the tenants' requirements, as the tenants could not reasonably blame AA for the delay since they were late in submitting their requirements in the first place.

[4] Escalators Breaking Down Repeatedly [see also paras 8.10 and 9.23-9.30]

16.15 Constructions Industrielles De La Mediterranee SA ("CNIM") is responsible for the first year maintenance of the installation of escalators which work was overseen by AA's maintenance team, and AA is responsible for the operation of the escalators. CNIM claimed that the problem and the huge number of visitors could not be foreseen before AOD; hence prevention was not possible.

16.16 Although the actual live load requirements of the escalators could not have been precisely foreseen, the Commissioners feel that the sensitivity level of the protective device of the escalators could have been set properly had sufficient tests been carried out before AOD. For this, Airport Management Division ("AMD") of AA and CNIM should both be responsible for not having sufficient tests or for failing to take precautionary measures. On the other hand, the users pressing emergency stops unnecessarily and foreign objects jamming the steps are facts of life, and are unlikely to have been avoided. For that, no one should be responsible.

16.17 Had the systems for automatic control and monitoring of smooth maintenance services that would enable staff of AA's Engineering & Maintenance Department and Airport Operations Control Centre ("AOCC") staff to respond quickly to any breakdown of the escalators been completed before AOD, the disruptions caused by the breakdowns would have been reduced. However, these monitoring systems were considered to be non-AOR critical, and were not completed before AOD apparently because of a shortage of time. The unavailability of these systems was patched up by AA sending duty staff of terminal operation carrying keys to restart escalators after visual inspection to clear any evident jams.

16.18 A more lenient view is that this is a teething problem, which was cured very easily and quickly. After AOD, the safety devices were promptly adjusted to the appropriate levels so as to match the actual working conditions and passenger load. This measure had proved successful. AA stated that on 8 July 1998 the escalators were working more smoothly and that a special team was on stand-by to deal with problems. After the adjustments made in the days following the AOD, stoppage rate has dropped to normal level of around 0.2 per escalator each month, which is considered to be a normal rate of operation.

[5] <u>Insufficient or Ineffective Signage</u> [see also paras 8.11 and 9.31-9.35]

16.19 The Commissioners are of the view that members of the public visiting such a large building as PTB for the first time will necessarily go through a period of familiarisation with the new environment. The complaints about inadequate signage do not seem to accord with the facts. In the light of evidence, conflict of allegations between the Board of Airline Representatives and AA cannot be resolved. In any case, airport operational readiness does not reasonably include signs for airline offices. After considering the evidence very carefully, the Commissioners cannot make a finding that the problem of inadequate signage existed. Even if it did, it was but a teething problem which was quickly remedied by the additional signs installed in July and August 1998. The Commissioners also accept the expert opinion of W51 Mr Jason G YUEN that it is quite common among major airports to have signage additions, revisions and refinement after the terminal has been put to actual use . It is also difficult to find fault with the design philosophy that is based on the logical flow of passengers within various parts of PTB. Further installation of signs will generate too many signs and they can be confusing and aesthetically offensive. Moreover, any perceived problem regarding signage in PTB was mitigated by the fact that extra AA staff wearing yellow sashes were on duty on AOD, trying to guide passengers around the landside. Accordingly, the Commissioners do not believe any organisation or person should be held responsible for the signage issue.

[6] <u>Slippery and Reflective Floor</u> [see also paras 8.12 and 9:36-9.39]

16.20 In the light of evidence, the problem of slippery and reflective floors is nothing but minor in nature having regard to its impact on the operations of the new airport. There were only five reported incidents of people slipping on the granite floors from AOD right up to the end of August 1998 and the figure is considered insignificant when compared with approximately six million users of PTB during that period. In two of the reported cases, granite flooring might not be the real culprit as water on the floor may be the major factor for its slipperiness.

16.21 The British-Chinese-Japanese Joint Venture ("BCJ") as the contractor for the PTB superstructure and Grant Ameristone Limited as the nominated sub-contractor responsible for the laying of the granite flooring do not have any role to play in the problem. They were not involved in the selection of the types of granite and the specification of the surface finish for the PTB floors. All the flooring works were completed to the architectural specifications laid down in the relevant contracts. In fact, choice of granite as well as workmanship for the laying of the PTB flooring are not crucial factors but, rather, post-installation testing and the subsequent remedy to problems identified may be the key to the alleged problems. Having reviewed the background leading to the issue, the Commissioners are of the opinion that AA has failed to take prompt and speedy remedial action to address the problem prior to AOD. The problem of slippery black granite floors at PTB was brought to the attention of AA as early as September 1997. Despite the fact that complaints were received about the slipperiness and reflectiveness of the granite floors following the airport trial in January 1998, there did not appear to have been any noticeable progress thereafter in seeking a solution to the problems. Possible courses of remedial actions were still being considered in May and June 1998 and at one stage AA even contemplated the possibility of bringing in an outside contractor to fix the problem. Although an effective remedy was eventually identified and necessary works were carried out through the nights shortly before AOD, the whole process was not completed until some time after airport opening. Although the problem itself is minor, the Commissioners do not accept that it is part of the usual teething difficulties since it is something that was identified and anticipated at an early stage and could have been eradicated before AOD. In this regard, AA and, in particular, its Project Division which was responsible for overseeing the design, installation and completion of the PTB flooring should be responsible for their lack of inefficiency in taking remedial actions. Should AA have tackled the matter more promptly, the problem of slippery and reflective granite floors would not have been allowed to develop into an issue in the opening of the new airport.

16.22 In his visits to the new airport, the Chairman of the Commission noticed that the black granite flooring was quite reflective and might cause embarrassment to persons wearing skirts. This matter had not been substantially raised in the inquiry, and the Commissioners would only request AA to employ measures to deal with it.

[7] Problems with Cleanliness and Refuse Collection [see also paras 8.13 and 9.40-9.49]

16.23 The problem of rubbish build-up was a short-lived one and had been quickly remedied after AOD. Although the number of airport users affected might be substantial, the problem is only minor in terms of the degree of seriousness. Having reviewed the evidence, the Commissioners consider that the principal cause of the problem lies with the delay of PTB tenants' fitting out works and the unscrupulous way of disposing of fitting out refuse, for which both the PTB tenants and the contractors employed by them for the works are undoubtedly culpable. Should the tenants have completed their fitting out works earlier and should they have been more self-disciplined in removing their refuse, the problem could have been far less acute than it had been on airport opening. On the other hand, AA as the management authority should also be responsible for its failure to ensure timely completion of fitting-out works by tenants and proper removal of the debris by them and their contractors.

16.24 Regarding the refuse collection system at PTB, the Commissioners have reasons to believe that there are inherent deficiencies in the design. As pointed out by Pearl Delta WMI Limited ("Pearl"), the refuse rooms were not adequate to handle the volume of refuse in some areas. This point was refuted by the Mott Consortium ("Mott") which stressed that the design was consistent with the appropriate standards. While the truth may lie somewhere in between, the Commissioners consider that more weight should be attached to the evidence of Pearl which is a reflection of the actual experience of the ultimate user of the waste collection system. Also, the refuse chutes between Level 3 and Level 5 are not continuous and this necessitates manual transportation of refuse along the walkway on Level 4. Obviously, this additional trip has an effect on the overall operational efficiency of the system. The absence of a refuse room for restaurant operators located at the area on top of the chutes seems to be more a design problem than anything else. In this regard, blame should be laid on both AA and Mott as parties responsible for the design. On the matter of late issue of permits and passes, there is insufficient evidence to enable the Commissioners to attribute responsibility.

16.25 From the sequence of events unveiled, it is quite clear that both AA and its various contractors uttered their best endeavours to overcome the problem before and after AOD. At the request of AA, BCJ employed 300 additional workers on top of its usual force of 200 for the three days prior to AOD and they worked round the clock in an attempt to clear up the debris accumulated. It is also evident that both Lo’s Airport Cleaning Services Limited and Reliance Airport Cleaning Services Limited hired a large number of extra staff for the weeks surrounding AOD to clear away the refuse from areas like the apron and the shopping mall. Unfortunately, because of the enormous amount of waste, from the tenants as well as from the large number of sightseers, these contractors were simply unable to cope with the work within a short time. As testified by W42 Mr NG Ki Sing during his oral testimony, the rate of waste build-up was so fast that it was actually more than anyone could handle. The Commissioners are convinced that both AA and its contractors did make great efforts to clear away the refuse although the fact remains that the problem of rubbish build-up persisted for a couple of days after AOD. In this regard, the Commissioners are not prepared to put any blame on the contractors which took part in the removal of waste. Despite the fact that there were things which were beyond the control of AA, the Commissioners, consider that AA, being the party responsible for the overall management of PTB, is responsible for its failure to ensure that adequate cleaning service was provided for the premises when the airport opened on 6 July 1998.

[8] Automated People Mover ("APM") Stoppage [see also paras 8.14 and 9.50-9.59]

16.26 In its submission, Mitsubishi Heavy Industries, Ltd. ("MHI") pointed out that it achieved service availability of 98% in the Confidence Trial, demonstrating completion of works in accordance with the particular technical specifications ("PTS") of Contract 350. The APM system operated effectively in all incidents to ensure the safety of passengers. Train stoppages triggered by matters already discussed conformed with the relevant design specifications of the system. Given the nature of APM as a mass transportation system, safe operation should be accorded first priority. MHI suggested that the alleged problems were in fact not problems but part of the safe and reliable operation of the APM system.

16.27 The Commissioners note that all of the problems identified with the APM system resulted in only slight disruption of train service and, consequentially, some degree of passenger inconvenience. In terms of the magnitude of their impact on the overall operation of the new airport as well as passenger safety, these problems are considered to be minor in nature. As far as the problem of occasional train stoppages is concerned, the Commissioners are of the view that both the train passengers and MHI should be held responsible. Passengers should be blamed for their improper behaviour in forcing themselves through closing vehicle doors or attempting to pry open doors. It is possible that most of the problems could have been avoided if individual components of the system such as sensitivity of the door control unit had been tested and modified to suit actual operational needs prior to AOD. From the evidence made available by MHI, the Commissioners have no reason to dispute that the APM system had been properly tested since the contractual target of 98% of service availability was achieved during the Confidence Trial prior to AOD. However, it is evident from the remedial actions taken so far that the causes of door-related failures and train overshooting and undershooting were technical or mechanical in nature and could be rectified by modifications to the door mechanism and other replacement and adjustment work. Although such problems can well be regarded as inevitable start-up difficulties which will disappear after fine tuning, the Commissioners hold the view that if more thorough testing and proper modification works had been done before commissioning of the system, the frequency of their occurrences could have been minimised.

16.28 The trapping of passengers on 20 July 1998 was fortunately a minor and isolated incident. The actual causes of the incident are considered to be more related in nature to behaviour than system. Responsibility for the incident should primarily lie with the improper behaviour of the five persons involved, if they failed to take proper heed of the train announcement and boarded the train at the West Hall departures platform against the announced advice. However, the Commissioners cannot conclude that the announcements against boarding were in fact made or audible to those persons. What is quite sure is that the persons ignored the advice of the APM operator to wait for the assistance of the APM maintenance staff. Instead, they resorted to the emergency door release valve to open the vehicle door and this eventually led to the deactivation of the train. They are, therefore, partly responsible for causing their incarceration. On the other hand, the Commissioners find that, prior to the incident, AA failed on its part to provide a sufficient number of station attendants at the West Hall departures platform to ensure that trains arriving there were properly cleared and no one would attempt to get on board. Although AA claimed that it had taken reasonable measures to the same effect, the Commissioners do not find the argument convincing because, apart from the repeated announcements to advise train passengers to alight at the West Hall departures platform and the advice of the APM operator sent through the intercom, no effective means of preventive control can be found in the evidence put before the Commission. As a matter of fact, had AA stationed sufficient attendants at the APM platforms after the system had been put in use, most of the train stoppage problems relating to door failures could have been avoided. As APM is a driver-less system, the need to station a sufficient number of attendants at the platforms for the purpose of keeping order is something that can and should be envisaged. As such, AA should be criticised for failing its duty to ascertain correctly the actual operational needs in terms of the keeping of the order of passengers while boarding or alighting from trains and to put in place sufficient attendants to attend to train problems at the platforms. Judging from the chronology of events, MHI as the operation contractor has adequately fulfilled its duty and has taken speedy remedial actions to restore the train service. In this regard, no blame is attached to MHI. The Commissioners also consider that the lack of effective communication means between AOCC and the APM maintenance staff while attending to emergencies remains an area which both MHI as the APM maintenance contractor and AA as the management should jointly look into in order to further enhance the speed of response in future incidents. The rescue action in the incident on 20 July 1998 could have been much quicker if the APM maintenance personnel had efficient use of the TMR provided by AA.

[9] Airport Express ("AE") Ticketing Machine Malfunctioning [see also paras 8.15 and 9.62-9.64] and
[10] Airport Express Delays [see also paras 8.15, 9.60-9.61 and 9.65-9.68]

16.29 In light of the evidence received, the Commissioners are satisfied that there were coin handling problems with the AE ticketing machines during the initial period of operation. Mass Transit Railway Corporation ("MTRC") as the operator of the service should be held accountable for the failure to provide problem free machines. It is quite evident that the software problem associated with the machines could have been detected earlier if, during the development and testing of the software, the range of parameters of coins was set at a level close, if not identical, to that in actual operation. Early detection of the problem would have allowed the contractor to look for effective ways to remove it well before AOD. MTRC has apparently failed to ensure that the ultimate product is capable of meeting fully the needs of users when in actual operation. Nonetheless, the problem is only a minor one having regard to its negligible impact on the operation of the new airport. MTRC is responsible for the train disruptions which the Commissioners accept were startup problems. Such problems have not recurred since early August 1998.

[11] Late Arrival of Tarmac Buses [see also paras 8.16 and 9.69-9.74]

16.30 A number of the problems were caused by the inefficiency of FIDS which resulted in lack of accurate flight information, serious flight delays, difficulties in coordination between boarding gate assignment and the location of aircraft. There were problems with TMR and airbridges which compounded to affect the tarmac bus service. The responsibilities of the relevant parties for the problems relating to FIDS, TMR and airbridges are set out in Chapter 13 and items [2] and [14] in this chapter respectively.

16.31 For the insufficient number of security cards issued by AA, this is part of the problems generally encountered by AA with the delay in the issue of security cards to airport staff which is described in item [27] on Access Control System in Chapter 16.

16.32 Under the relevant franchise agreement, Hong Kong Airport Services Ltd. ("HAS") had to provide 22 new buses, 19 for operation and three in reserve. On AA's allegation that HAS had provided insufficient bus drivers and passenger buses necessary for AOD and subsequent days, HAS stated that on AOD, 38 drivers and 19 buses were made available, more than the planned 23 drivers and 12 buses previously calculated by HAS based on the aircraft parking stand allocation plan provided by AA on 18 June 1998 in which AA had anticipated 16 flights scheduled to arrive at remote stands which needed to be serviced.

16.33 HAS had apparently admitted to being 30% understaffed on AOD in a memorandum prepared for the Bussing Review meeting scheduled for 16 July 1998. HAS disagreed with AA's interpretation of the alleged admission which, as HAS contended, merely compared the current required staffing levels with the original planned staffing levels for HAS' bussing service. HAS maintained that its resources were in excess of its calculated needs and that the problem was mainly caused by the lack of accurate flight information.

16.34 AA further contended that HAS had failed to make any allowance for off-schedule flight operations.

16.35 According to the evidence presented by AA, there was only one bus available in reserve, instead of three as agreed between AA and HAS. HAS' reply was that as it had 19 buses running on AOD, it meant seven more buses available than the calculated figure of 12 based on the aircraft parking stand allocation plan provided by AA. While it is unnecessary to decide whether it was proper for HAS to rely on AA's plan in estimating the necessary driver and bus force for operation on AOD, and it is not within the Commission's terms of reference to determine contractual liability, it is clear that had two more buses been made available as reserve on AOD and Day Two, the added 10% of buses would have helped to alleviate the situation. This alleviation was not attained because HAS only provided 20 buses on those days. The responsibility for this situation must be attributed to HAS.

16.36 The main cause for the inefficient and late tarmac bus service was the deficiency of FIDS resulting in the lack of accurate and prompt flight information that should have been available to HAS. The problems with the airbridges and the TMR overloading compounded the difficulties. HAS' manpower was strained as they were required to locate exactly where the aircraft were. The inability of using TMR to relate messages meant that buses were required to return to PTB to receive instructions and information of the location of aircraft. Delays resulted in serving the aircraft in a timely way and extra trips were necessary for the buses. The Commissioners are of the view that AA should be responsible for all these factors which caused the late arrival of tarmac buses.

[12] Aircraft Parking Confusion [see also paras 8.16 and 9.75-9.78]

16.37 Aircraft parking confusion is a problem consequential upon the problems relating to FIDS and ACC's practice of confirming stand allocation. The responsibilities of the relevant parties for these initiating problems are described in Chapter 13.

[13] Insufficient Ramp Handling Services [see also paras 8.18 and 9.79]

[14] Airbridges Malfunctioning [see also paras 8.19 and 9.80-9.84]

16.38 The delay in providing mobile steps for passengers to disembark from aircraft parked at remote stands was similar to that in the provision of tarmac bus service discussed in item [11] above. However, all three ramp handling operators, instead of HAS alone, were involved in serving the passengers of the airlines they contracted respectively to serve. The causative problems involved, such as the deficiency of FIDS, were also the same as those relating to tarmac buses, and the conclusions of the Commission on responsibility in paragraph 16.36 above are adopted here.

16.39 The Commissioners find that PT. Bukaka Teknik Utama-RAMP Joint Venture is responsible for the programming error that caused the auto-leveller alarms. Only B737 mockups were used in operation tests since there was no requirement by AA to have tests conducted with B747 mockups. The extent of testing was of course a matter for AA and Bukaka Ramp to decide. The Commissioners are of the view that the problems might well have been identified if more varied or extensive testing or trials had been conducted. For this, AA and Bukaka Ramp or one of them should be responsible.

16.40 The Commissioners do not believe that the problems experienced with the airbridges were caused by operator error. First the auto-leveller system contained a software error resulting in alarms. Second, all operators had been certified by AA before they were allowed to operate the airbridges single-handedly. Third, airbridge operation was not a difficult process. While operator error may have triggered airbridge faults on occasions, it would not have resulted in recurrent problems. The Commissioners therefore do not think that the operators should be blamed.

[15] <u>No Tap Water in Toilet Rooms and Tenant Areas</u> [see also paras 8.20 and 9.85-9.95]

[16] <u>No Flushing Water in Toilets</u> [see also paras 8.20 and 9.85-9.95]

(a) <u>Problems relating to Tank Rooms 3 and 8</u>

16.41 The AEH Joint Venture ("AEH") and Rotary (International) Limited ("Rotary") were responsible for the installation of the valves that failed before AOD. As a result, Tank Rooms 3 and 8 had to be operated manually on AOD. Whatever the reason for the malfunctioning of the valves, the interruption in the supply of potable water was caused by the inability of Rotary's staff in obtaining security permits to gain access to the tank rooms in order to maintain their operation.

16.42 According to Rotary, due to new security arrangements, their staff were denied access to Tank Rooms 3 and 8, which are in a restricted area. W25 Tsui of AA said that there was a change in access control procedures a few days before AOD as well as on AOD. He also said that there were some problems experienced by some contractors in obtaining permits in time before AOD although he did not mention the names of those contractors. However, AA denied that there was any unexpected change in security arrangements. AA alleged that AEH should have been aware of the need for permits to allow access to the tank rooms on AOD and that they should have ensured Rotary, their subcontractors, were likewise aware of these requirements. AA maintained that there were delays on the part of business partners and contractors in seeking proper permits into restricted areas.

16.43 Mr Shafqat Tariq, Project Manager - Hydraulics of Rotary said in his witness statement that at around 10 am on AOD, he called Mr Wallace TANG (electrical superintendent of AMD, AA) and explained to him the problem with filling the water tanks and asked him to put AA staff in the tank rooms to man them. Mr Tang however had a different story. Whilst he remembered the conversation with Mr Tariq, he did not remember Mr Tariq asking him to arrange for operation of the tank rooms. He recalled Mr Tariq telling him that there had been a problem with filling the tanks, which Mr Tariq had rectified by making manual adjustments to the valves. Since that problem had been fixed, Mr Tang thought there was no need to take any remedial action.

16.44 As the Commission has had no opportunity to hear the oral testimony of these two gentlemen and other relevant witnesses on these issues, it is not possible for the Commissioners to come to a proper conclusion as to who or which of the versions should be believed. Whilst there is contradictory evidence regarding the difficulty of Rotary's staff in gaining access to the tank rooms and whether Rotary had asked AMD to operate the tank rooms on AOD, it appears to the Commissioners that there was lack of coordination between AA, AEH and Rotary to ensure that Rotary would be allowed access to the tank rooms on AOD, for which AMD of AA should reasonably be responsible as manager of the new airport.

(b) Problems relating to Tank Room 2

16.45 Nishimatsu Construction Company Limited ("Nishimatsu"), the contractor providing drainage service, acknowledged that the flooding was caused by blockage in the length of the pipework for which they were responsible. It was found on 18 July 1998 that a section of the pipe was broken. Nishimatsu acknowledged that it was responsible for the clearance of the blockage and the repair of the damaged pipe. However, Nishimatsu maintained that it was only notified of the flooding problem on 5 July and therefore it was not able to rectify the problem until 13 August 1998. AA admitted that they had only instructed Nishimatsu to investigate the matter after the flooding in Tank Room 2 on 7 July.

16.46 Flooding did not occur for the first time after AOD: there had been flooding of tank rooms since late May 1998. During the flooding on 30 May, temporary pumps were installed to pump dry the tank room. AA admitted that they foresaw the flooding and had taken preventive measures by instructing BCJ, the main contractor responsible for construction of pipes underneath the tank rooms, to remove any blockages in the pipe to Tank Room 2. BCJ carried out these instructions. Nishimatsu was also asked to employ a high-pressure water jet company to clean the pipe work in this area. AA, however, did not ask Nishimatsu to deal with these early flooding problems as it thought that it was the responsibility of BCJ who was primarily responsible for the pipe work directly underneath the tank room. In relation to the flooding which occurred on 7 July, AA alleged that BCJ, having discovered that the blockage was not in their part of the pipework, should have known that it must have been in that part for which Nishimatsu was responsible. Accordingly BCJ should have notified Nishimatsu. However, BCJ alleged that it did not have responsibility nor authority to give notice to AA's other contractors with respect to defects in other's works.

16.47 Despite the steps taken by AA, further flooding continued to occur on 23 June, 29 June and 5 July. Notwithstanding the few reported incidents on flooding and before the cause of the flooding had been identified, AA did not see fit to instruct Rotary to install a pump to prevent further flooding or take other preventative measures.

16.48 Having considered the evidence, the Commissioners come to the conclusion that the flooding in Tank Room 2 was foreseeable and preventative measures, for example, the installation of sump pumps to control the flooding, should have been taken by AA and AEH prior to AOD. Indeed, AA admitted that no preventive measure was put in place before AOD. The Commissioners are also of the view that there was also a lack of coordination amongst AA, BCJ, Nishimatsu, AEH and Rotary, for which AA as manager of the new airport should be primarily responsible.

[17] Urinal Flushing Problems [see also paras 8.20 and 9.96-9.110]

(a) Flow of flushing water

16.49 One of the experts appointed by the Commission, W54 Professor Xiren CAO, is of the opinion that the design of the flushing system was not appropriate, given the poor condition of the seawater. On the evidence, the Commissioners find that AEH should be responsible for the following matters:

(a) failing to provide a satisfactory flushing system for the urinals, and in particular, for using inappropriate flushing valves which were subsequently replaced at its own expense; and

(b) failing to install weirs to stop sand and dirt getting into the water pipes which would have been a remedial measure for alleviating the accumulation of sediment in the valves.

16.50 AEH's failure to complete the testing and commissioning of the hydraulic system could well be another cause of the problem, but there is insufficient evidence before the Commission to make a proper & fair finding on this issue.

16.51 The Commissioners accept W54 Cao's expert view that there was some design problem, for which AA should be responsible. AA should also bear some responsibility in not taking prompt and sufficient remedial actions to prevent or alleviate the flushing problem since the problem had been identified in early 1998.

16.52 On the alleged two outstanding problems, namely, corrosion of the solenoid valves and the pressure setting, AA alleged that AEH had failed to resolve these problems and AA was carrying out its own remedial work on the corroded valves. There is conflicting evidence as to whether there remains a problem with the setting of the pressure of the valves and the Commissioners are not able to come to any view on this issue.

(b) Problem with sensors

16.53 There is conflicting evidence as to who is responsible for the correct setting of the sensors. AA alleged that AEH had not taken into account the fact that the sensor would be installed on a part of the wall which was about 6 inches further back than the lower portion of the same wall on which the urinals were mounted, making the gap between the user and the sensor greater than 18 to 24 inches as preset by the manufacturer. However, Rotary, AEH's subcontractor, stated that the sensor was not preset and that it could be adjusted to the optimum range between 18 and 36 inches within 20 minutes of power being switched on the system. The Commissioners tend to prefer the evidence provided by Rotary as it would be difficult to understand why the sensors could have been designed with the rigid operational range as alleged by AA. However, as there is conflicting evidence as to which party is responsible for the correct setting of the sensors, no firm conclusion can be reached. W51 Yuen, another expert appointed by the Commission, opined that public misuse is a normal occurrence in a busy airport. The Commissioners agree, and given that there were so many people visiting the airport in the early days of airport opening, the Commissioners are of the view that the blame for the damage to sensors should not be attached to AA, AEH, Rotary or Lo's.

(c) Blockages of urinals

16.54 Blockages were mainly caused by public misuse and the problem was exacerbated by the huge number of visitors to the airport when it first opened. Lo's, the cleaning contractor, was responsible for clearing rubbish in the urinals and therefore preventing blockages in urinals. As described below, this task was made more difficult by other problems such as the disruption to flushing and potable water to toilets.

(d) Cleanliness of toilets

16.55 Lo's was responsible for keeping the toilets clean. Whilst there might have been staff training and supervision issues, the cleaning task was hampered by other problems such as the flushing problems, lack of potable and flushing water and blockage of urinals. The problem was exacerbated by the sheer number of curiosity visitors and stranded passengers during the first few days of operation of the new airport. On the whole, the Commissioners are of the view that the toilets were not sufficiently clean due to the shortage of manpower. This could have been caused by the requirements of labour imposed by AA being too low, or Lo's failure to deploy sufficient people to perform the task. However, on the evidence received, the Commission is not able to decide.

16.56 The shortage of manpower was, according to the Commissioners' view, partly caused by the question of permits for restricted areas of PTB. In reply to Lo's allegation that it had problems in obtaining permits, Aviation Security Company Limited ("AVSECO") said that Lo's had been issued with 309 permits out of 660 applications from Lo's. The remaining permits were not issued because, according to AVSECO, the staff of Lo's had failed to turn up for photo-taking or for collection of permits. On this matter, again the Commission considers the evidence received not sufficient for it to make any proper or fair finding. This matter, however, relates to coordination and operation between contractors working within PTB, and AA as their employer and manager of the new airport should primarily be responsible.

[18] Toilets Too Small [see also paras 8.21 and 9.111-9.122]

16.57 The Commissioners accept that a larger number of smaller toilet blocks rather than fewer but larger blocks is a proper and reasonable design concept for the new airport because of the sheer size of PTB. Having regard to the fact that the actual toilet provisions have already exceeded the prescribed standards laid down in the British Airport Authority guidelines, the view of counsel for the Commission was that complaints about the lack of toilets was not fully borne out by the evidence. The Commissioners accept this view. The scenario at the Kai Tak airport, which had very big toilet blocks, may have had a psychological impact on airport users, creating and reinforcing their impression that toilets in the new airport might be too few and too small.

16.58 Concerning the issue of trolley accessibility to toilets, the Commissioners accept the views of Mr Barry Ball, Senior Architect – Interiors of AA, that the decision of not allowing trolleys into toilet blocks is a correct one. The reason for allowing trolleys in would be primarily to allow passengers to keep sight of their baggage on trolleys while using the toilet facilities. However, since it was never a realistic option to allow baggage trolleys inside the cubicles, trolleys would still have to be left unattended for certain periods. The Commissioners also accept the opinion of W51 Yuen in his supplemental expert report of 1 December 1998 that AA's policy of not allowing baggage trolleys into toilet rooms is common amongst many airports.

16.59 W51 Yuen, however, pointed out that the passageway to the toilet room might be too narrow and did not allow two people carrying hand baggage to pass each other easily. He went on to add that toilet rooms in many airports had two passageways, one for entrance and the other for exit so as to avoid the problem. While accepting that toilet provisions in the new airport have been designed in accordance with recognised industry standards and are in line with those in most hotels and public buildings, the Commissioners are inclined to conclude that toilets and their passageways could perhaps have been widened slightly for the convenience of airport users. Even W3 Dr Henry Duane Townsend agreed during his testimony that Mott could have adopted more generous standards in planning toilet provisions. As a matter of principle, consideration of commercial rental revenue should never take priority over public convenience in the design of PTB. There is, however, no hard evidence before the Commission to suggest that AA has inappropriately trimmed down toilet facilities in the new airport in order to maximise the commercial rental space in PTB. Nevertheless, it remains a fact that public expectations have not been fully met in this respect and more generous allowances for space in toilets could have been provided.

[19] Insufficient Water, Electricity and Staff at Restaurants [see also paras 8.22 and 9.123-9.136]

(a) Water and electricity supply

16.60 The Commissioners are of the view that both AA and the relevant tenants probably contributed to the water and electricity problems. The tenants and AA had a part to play in the electricity problems related to the system upgrade of the electricity system. However, due to limited time available to this Inquiry and without investigating further into this matter, it is not possible for the Commission to apportion responsibility.

16.61 The length of the electricity outage on 7 July 1998 should properly be attributable to the AA or AVSECO because AA's maintenance personnel and contractor's staff were denied access by a security guard to effect remedial work. As the outage was caused by improper loading settings of the installation of the tenant concerned, the tenant is probably responsible for causing the problem although it is not possible for the Commissioners to assign responsibility.

16.62 It is not clear who is responsible for the electricity outage on 17 July 98. Although AA suspected that the negligence of a contractor of Cathay Pacific might have caused the outage, there is no substantial evidence before the Commission. According to Cathay Pacific's contractor, they had no record of the alleged incident.

16.63 In relation to the disruption to the water supply on AOD and the few days thereafter, please refer to the discussions under items [15] and [16] above.

(b) Staffing problems

16.64 AVSECO alleged that the delays in the processing of permits were for reasons out of their control, including the massive last-minute rush for permit and the frustrating regular breakdown of ACS and the permit computer system. It also stated that it had taken a number of contingency measures, including the flexibility given to and prompt processing of escorted and three-day temporary permits and additional temporary staff deployed by the Permit Office to ensure 24-hour and seven-day a week service to the permit applicants. Without hearing oral testimony, it is impossible for the Commissioners to reach a fair conclusion on these issues.

16.65 The sheer number of sightseers also exacerbated the problem, especially when the staff were not familiar with the new environment. The tenants should also be responsible for ensuring that a reasonable level of service was provided to the public and that the staffing should be sufficient and well trained.

[20] Rats Found in the New Airport [see also paras 8.23 and 9.137-9.139]

16.66 Reports in newspapers and on television on the problem of rat infestation were probably exaggerated through the media process. The Commissioners are satisfied that it is but a minor problem and is under control. AA has implemented a range of measures to contain the problem. Although it is not certain whether rats would be eradicated in the new airport, provided AA can keep up with its rodent control programmes, the situation will no doubt continue to be under control.

[21] Emergency Services Failing to Attend to a Worker nearly Falling into a Manhole while Working in PTB on 12 August 1998 [see also para 9.140]

16.67 After reviewing the evidence on the case, the Commissioners consider that upon the first call for help, an ambulance as well as a fire engine with trap rescue equipment should have been despatched. The Commissioners find that either the caller who made the first call to request for ambulance service was not accurate in providing necessary information or the receiver of the call had not asked the appropriate questions, resulting in only an ambulance being sent. Had it been made known at the time of the first call that special service operation crew was required to save the injured worker, the actual rescue would not have been delayed by 21 minutes. On the basis of the information available, the Commissioners are unable to ascertain who is responsible for this delay. This is however only a minor incident.

[22] Traffic Accident on 28 August 1998 Involving a Fire Engine, Resulting in Five Firemen being Injured [see also para 9.141]

16.68 The Police investigated into the accident immediately upon its occurrence but did not find sufficient evidence for further action to be taken. Later, the Traffic Accident Inquiry Board of Fire Services Department also made investigation within the Department and found that the accident could be attributed to the driver's misjudgement on the prevailing traffic situation, road configuration and the weather condition. The driver was suspended from driving duties until he successfully passed a driving re-examination. He was also held responsible for paying the repair cost of the damaged vehicle. Since the accident has been thoroughly investigated by both FSD and the Police, the Commissioners do not have anything further to add save to agree with FSD's findings.

[23] A Maintenance Worker of HAECO Slipped on the Stairs inside the Cabin of a Cathay Pacific Aircraft on 3 September 1998 [see also para 9.142]

16.69 This is an accident and no one should be held responsible for it.

[24] A Power Cut Occurring on 8 September 1998, Trapping Passengers in Lifts and on the APM as well as Delaying Two Flights [see also para 9.143]

16.70 The Commissioners regard this as a minor incident. Since investigation into the incident is ongoing and not all materials are available, the Commissioners cannot take any view on the question of responsibility.

[25] Missed Approach by China Eastern Airlines Flight MU503 on 1 October 1998 [see also paras 9.144]

16.71 According to AA, missed approaches are not infrequent occurrences in an airport. Based on the material supplied by AA, it appears to the Commission that the incident was handled safely, efficiently and in accordance with laid down procedures. No responsibility should be attached to anyone.

CHAPTER 17

RESPONSIBILITY OF THE AIRPORT AUTHORITY

Section 1 : AA's Obligations under the Airport Authority Ordinance

17.1 According to the Airport Authority Ordinance, Airport Authority ("AA") has the following functions, duties and objectives:

(a) to provide, operate, develop and maintain the new airport [the preamble to the Ordinance] and to provide such facilities, amenities or services as are, in its opinion, requisite or expedient [s 5(1)(b)];

(b) to maintain Hong Kong's status as a centre of international and regional aviation [s 5(1)(a)];

(c) to conduct its business according to prudent commercial principles [s 6(1)]; and

(d) in conducting its business and performing its functions, it shall have regard to safety, security, economy and operational efficiency and the safe and efficient movement of aircraft, air passengers and air cargo [s 6(2)].

17.2 For the purpose of the inquiry, one should note that AA's business includes the operation of the new airport and that in conducting such operation it shall have regard to the safe and efficient movement of air passengers and air cargo. That being part of AA's statutory duties and functions is therefore indisputable. The problems encountered on airport opening day ("AOD") reveal that AA did not have sufficient regard in these respects when opening the airport for operation on 6 July 1998. While little blame should be attached to AA for the teething problems which are inevitably facts of life, AA must be responsible for the other and major problems that created the chaos on AOD because no or insufficiently efficient movement of air passengers and air cargo was provided. AA employed contractors in the discharge of its duties, and when the work performed by the contractors or their subcontractors did not come up to standard giving rise to a problem, the contractors and subcontractors, if they can be ascertained, must be primarily responsible. The issues involving the relationship and responsibility between AA on the one part and its contractors and business partners on the other are reviewed in other chapters. It is also necessary to examine matters relating to the internal organisation, working and action of AA and its key officers that caused or contributed in causing the problems, and this chapter deals with the problems identified through the evidence that relate to co-ordination and communication within AA and between AA and Government.

Section 2 : Co-ordination and Communication

17.3 Issues of co-ordination and communication were identified in the documentary evidence. The deficiency of co-ordination in AA was noted by the New Airport Projects Co-ordination Office ("NAPCO") in the Airport Development Steering Committee ("ADSCOM") Paper 34/97 dated 19/9/97 prepared by it. A number of passages dealt with the organisation and co-ordination aspects of AA. NAPCO's comments on the organisation structure of AA and questions of co-ordination and communication were as follows:

> "The 'matrix' organisational split of AOR ("airport operational readiness") responsibilities between the various AA Divisions is not functioning efficiently, and information and decision-making 'bottlenecks' exist. We also find that programme and other essential information is not fully shared between the AA and Business Partners. We recommend herein that a single-point responsible high-powered executive manager be vested with requisite and clear authority to direct the AOR process and dictate action inclusive of all participants – AA (including all Divisions), Business Partners and Government. We further recommend that a full 'open book' approach to co-ordination and information sharing be implemented immediately inclusive of all participants."

17.4 NAPCO also found that co-ordination within the AA itself, particularly amongst the following divisions, the Airport Management Division ("AMD"), the Project Division ("PD") and the Commercial Division, as well as co-ordination and cooperation between the AA, its business partners, Government and all others required intensified attention and immediate improvement. The co-ordination and cooperation between AMD and PD was particularly important from about the last quarter of 1997, as the new airport was transitioning from the construction stage to the operation stage, from the care and responsibility of PD to those of AMD. While PD was concentrating and prioritising on the works side, AMD was eventually to be handed over the works and systems developed under the auspices of PD, and AMD had to use the services and facilities so provided to develop and implement familiarisation and training programmes and trials, to review

AOR-related issues, and to operate and run the new airport.

17.5 The point was stressed in the 170th ADSCOM meeting on 20 September 1997, when the then Director of NAPCO, W48 Mr Billy LAM Chung Lun, was recorded as saying: "AMD should be in the driving seat of the airport project at this point in time, but because of the personalities involved, it was being pushed round parameters set by PD and had yet to gear itself up." The Deputy Director of NAPCO advised that W3 Dr Henry Duane Townsend should, but did not, quickly and firmly resolve this problem.

17.6 At the 171st ADSCOM meeting on 13 October 1997, W36 Mrs Anson CHAN, the Chief Secretary for Administration and the Chairman of ADSCOM ("the Chief Secretary"), enquired with AA officers present about the relationship between PD and AMD. The Divisional Manager (Planning & Scheduling) of AA responded that their relationship was getting better every day. W3 Townsend added that AMD had more people working on site then. The Chief Secretary stated that she wanted the two divisions to work in concert towards the target and requested W3 Townsend to keep a close watch on the situation and to sort out any difficulties between them promptly. The Director of NAPCO, on the other hand, reported that the relationship between PD and AMD had much improved.

17.7 The notes of the ADSCOM special meeting on 7 November 1997 also recorded Director of Civil Aviation ("DCA") as saying that he had no faith in the top management of AA. He said that the project was driven by the Project Director, W43 Mr Douglas Edwin Oakervee who always tried to bulldoze his way through. W3 Townsend was not in control and the organisation was not functioning as it should. DCA gave an example of the problems on the software side. Build 1.5 failed to arrive on 3 November as scheduled, and the AA management could not give him a date on which it would arrive. DCA was worried about systems integration within Flight Information Display System ("FIDS") and about its integration with other airport systems. There had to be definitive contingency measures in case of failure, but so far AA had only developed crude contingency plans. In his view, for the airport to operate, the Airport Operational Database ("AODB") system had also to be interfaced with the Aeronautical Information Database. The latest schedule of 15 February 1998 was too close to the opening date for comfort. There would not be enough time to put in contingency measures and for sufficient re-training. DCA was also unsure of the software implications of the standalone systems, and he failed to obtain any reassurances from W3 Townsend. At the same meeting, the Director of NAPCO revealed that the joint study carried out by NAPCO and AA on AA's airport operational readiness ("AOR") programme had in effect forced AMD and PD to start talking to each other, which was something they should have done months ago.

17.8 There was difficulty in Government obtaining information from AA. NAPCO recorded the lack of cooperation from AA in its Weekly Site Report of 7/3/98. NAPCO's attempts to find out what was going on regarding systems integration during the period were continually thwarted because AA staff were warned not to say anything. No wonder that NAPCO started to distrust AA. NAPCO reported that AA would claim that, "all the scheduled tests were completed", however, the reality was that the system could not yet display flight information at a number of locations.

17.9 In its Weekly Situation Report of 1/5/98, NAPCO reported that it had still not received the AA's quantification of additional requirements for the contingency plan in case of FIDS failure, as promised.

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17.10 Another week passed by, NAPCO again reported that AA claimed to have corrected many of the FIDS critical software issues and resolved the Societe Internationale de Telecommunications Aeronautiques ("SITA") (Common User Terminal Equipment ("CUTE")/FIDS interface problems with implementation at site continuing). However, a number of software issues, which AMD stated as critical, were still outstanding and this raised concerns as to AA's ability to establish Day One operating scenario. AA was developing the contingency FIDS with GEC (Hong Kong) Ltd ("GEC") and Hong Kong Telecom CSL Limited ("HKT") but the time available for development was short. Work to interface FIDS with other systems such as AODB, Baggage Handling System ("BHS") etc continued and updates to AODB software was due in mid May.

NAPCO had been chasing AA but had still not received its quantification of additional data transfer requirements [Weekly Situation Report, 8/5/98].

17.11 In the ADSCOM Chairman's brief prepared by NAPCO for the 183rd meeting of ADSCOM on 22 May 1998 and in the minutes of that meeting, NAPCO pointed out that by opening, the airport systems would largely operate in standalone mode. It was clear from the AA report that lots of integration were still underway and programmed for completion by the end of May 1998. ADSCOM had been assured that systems existed for manual data transfer. However, as most systems had to be operated on a standalone basis, more staff, procedures, etc, had to be organised. The quantification of what this involved in terms of equipment, staff, changed procedures, training, etc which NAPCO had been after for months had yet to be forthcoming from AA. In the Summary of Critical CLK Issues, dated 19/6/98, NAPCO again stated that the demonstration of the viability of workarounds, schedule and procedures of installing enhancements, system status etc were all expected in a detailed report which was still not yet received. NAPCO had yet to receive from AA the quantification of additional data transfer requirements under the contingency scenario.

17.12 As late as May 1998, the co-ordination between AMD and PD still caused concern. In his Weekly Site Report for the week ending 23/5/98, NAPCO's Mr David Thompson, Senior Coordinator for Special Systems, reported that in order to accommodate the new back up system to FIDS, AMD needed to have some more workstations, without which there would be problems for system development and training functions. In answer to a NAPCO question concerning the reason why five additional workstations had not simply been purchased, it appeared that PD was not willing to spend money and AMD did not have access to funds.

17.13 There was also a co-ordination problem regarding the testing of Government entrusted works. In a memo dated 28/5/98 from W33 Mr KWOK Ka Keung, Director of NAPCO, it was noted that the continuing delays in testing and commissioning of Civil Aviation Department ("CAD") systems were the result of ongoing AA installation, testing and commissioning problems with the primary AA systems. Thus, until the primary AA systems were fully functional and operational, CAD systems which were dependent upon the AA master system could not be adequately tested or commissioned.

17.14 Eventually, however, the co-ordination between NAPCO and AA improved. W31 Mr James WONG Hung Kin, Project Manager in NAPCO, testified on this matter before the Commission. The very detailed internal project reports prepared by AA were originally only supposed to be available to the AA Board members. That practice was changed in mid-1996. After that, AA was much more open to Government and shared with NAPCO its internal reports. From those working level reports, NAPCO staff on the site knew a lot more about the true picture in addition to having day-to-day contact with AA's working level staff. The relationship gradually improved a lot, particularly towards the end of the project. In the half year before AOD, AA was quite open towards NAPCO by allowing NAPCO staff to take part in the site acceptance tests ("SATs") and to visit Interface House which was previously quite closed to outsiders, including NAPCO. W31 Wong said that towards the end of the project, NAPCO generally had quite a good feel about the progress of a wide spectrum of the AA works, and focussed their attention on FIDS by reason of its apparent difficulties and also to interfaces with Government entrusted works, because Government departments had to have available a lot of facilities at the new airport.

17.15 W43 Oakervee (Director of PD), W44 Mr Chern Heed (Director of AMD), W45 Mr Kironmoy Chatterjee (Head of Information Technology ("IT")) and W46 Mrs Elizabeth Margaret Bosher (Director of Planning and Co-ordination), all of AA, gave evidence before the Commission as a group. In the course of their evidence, they all denied that there was insufficient communication or co-ordination amongst themselves or their Divisions and Departments. All along, the organisation structure of AA was such that W43 Oakervee and W44 Heed, the Directors of the two most important Divisions, PD and AMD, reported to W3 Townsend, the Chief Executive Officer ("CEO"), who would co-ordinate and decide on the important issues, especially those regarding the transition from projects to airport operation. As pointed out in the ADSCOM meeting on 7 November 1997, W43 Oakervee "bulldozed" his way through, W3 Townsend was not in control, and the organisation was not functioning in the way it should. As a result, AMD was afforded lower priority to PD although AMD was going to operate the airport eventually and the works and systems would have to be suitable and fit for operation according to the operators' requirements. NAPCO advised in ADSCOM Paper 34/97 dated 19/9/97 that a single-point responsible high-powered executive manager be vested with requisite and clear authority to direct the AOR process and dictate action inclusive of all participants – AA (including all Divisions), Business Partners and Government.

17.16 Several issues were involved, namely, the organisational structure of AA, the co-ordination between PD and AMD, the lesser importance placed on operational requirements than on the works programme, and personalities of the senior management. These issues were quite intertwined. W44 Heed admitted that it was partly true that he allowed himself to be pushed around and W3 Townsend was not backing him up. When called back to give evidence again, W3 Townsend explained the preponderance he placed on the works carried out by PD by saying that PD was the major part of the organisation up to AOD representing about three-fourths of the total organisation whereas AMD did not really start to grow and expand until the latter part of 1997. When W48 Lam was appointed as the Deputy CEO of AA in January 1998 to be in charge of the AOR programme, W44 Heed reported to him while W43 Oakervee continued to report to W3 Townsend. W48 Lam told the Commission that when he became the Deputy CEO, W3 Townsend intimated that W43 Oakervee would continue to report to him (W3 Townsend). While admitting that W43 Oakervee continued to report to him instead of to W48 Lam after the latter's appointment, W3 Townsend pointed out that W48 Lam reported to him and when W48 Lam needed help or direction, W3 Townsend was there helping W48 Lam. He further added that that W43 Oakervee worked closely with the AOR programme by having Mr Alistair Ian Thompson, W43 Oakervee's number two man attending the AOR meetings chaired by W48 Lam. By all these, W3 Townsend implied that there was no lack of co-ordination.

17.17 W48 Lam used to be the Director of NAPCO, occupying that position from 22 March 1993 until 5 January 1998 when he was seconded to AA as Deputy CEO. He was one of the contributors who commented on AA's organisational structure and the personalities of its top management in the NAPCO papers and ADSCOM meetings between September and November 1997. At a site inspection on 12 March 1998, W48 Lam received a serious injury to his leg and as a result he was hospitalised for a week and had his leg in plaster cast for six weeks thereafter. He was given sick leave which lasted till 15 June 1998. However, he resumed his duties at AA before the end of his sick leave but needed to go for physiotherapy almost daily, and sometimes he had to excuse himself from meetings. His duties in AA were to be in charge of two main matters, the AOR programme and the planning and preparation for relocation from Kai Tak to Chek Lap Kok ("CLK"). He spent about half of his working time in AA for the relocation programme. After W48 Lam joined AA as its Deputy CEO, he established weekly meetings on AOR issues ("AOR Meetings") so as to pull the staff from various Divisions together in order to improve co-ordination amongst them and ensure focus on critical AOR issues. Apart from the AOR Meetings, W48 Lam also gave examples of how he helped co-ordination. On several occasions, W48 Lam asked W44 Heed and his AMD staff to put their operational requirements and outstanding problems in writing to W43 Oakervee and PD senior staff, so that the situations could be remedied. However, apparently operational management demands were still deferred to project requirements. W44 Heed told the Commission that he knew that when the systems were handed over to his AMD, they had not been fully tested and commissioned. He knew that for whatever reason projects were delayed he had to take the consequence. He felt that he had no alternative and had a lot of frustration. W3 Townsend mentioned that the construction activities were moving very fast and that testing and commissioning required very strong control, which according to him, was certainly provided by W43 Oakervee. He and W43 Oakervee got along very well together in terms of reporting relationships. W43 Oakervee's comment on the organisation structure of AA was that AA adopted a "matrix management" structure which was fine for communication expected between one division and another, but he preferred a "hierarchical management". It is difficult to understand why W43 Oakervee favoured hierarchical management, which supposedly means that the higher rung on the hierarchy should control and give orders to those on the lower rungs. That would have been accomplished if W3 Townsend had been in control, and if the Commissioners understand W43 Oakervee correctly, he must have meant that one needs a masterful personality to be the CEO. That would be another way of agreeing with NAPCO's advice that W3 Townsend was not in control. When questioned about the implication of Oakervee's evidence of "hierarchical management" that a masterful person should be at the helm, W3 Townsend agreed that it might have been the way as W43 Oakervee envisaged, but added that the AA management relied very heavily on delegation whereby instructions given were followed, people were held accountable for their activities, and support was given to them.

17.18 Judging from the evidence of W3 Townsend, W43 Oakervee and W44 Heed, and having carefully observed the demeanours of these three witnesses, it appears to the Commissioners that the difficulties encountered by W44 Heed and his AMD were not a consequence of the organisational structure. It rather boils down to a matter of personalities and the interaction of personalities amongst the top echelon of the AA management. While W3 Townsend was correct in saying that he had W43 Oakervee to exercise strong control over the construction works, their progress and the testing and commissioning of the systems, the assertive and imposing character of W43 Oakervee greatly influenced W3 Townsend, relatively milder in personality, in placing the too much significance and priority on PD and giving less support to AMD in its planning and preparation for the operation and management of the airport in the making than AMD rightfully deserved. W44 Heed, a soft-spoken and less resolute personality, took whatever was on offer, well knowing that he would be facing great difficulties when operating the new airport after the systems were handed over to AMD from PD with the degree of testing and commissioning leaving much to be desired.

17.19 When the question was put whether he considered that there was a leadership problem with W3 Townsend, W48 Lam said that it was not so much a question of leadership but rather a question of personality as well as a question of emphasis. W48 Lam believed that W3 Townsend's emphasis with his engineering background was on the engineering side, on the works side, and to complete the project on time and within budget, and airport operation not being his forte or specialty, W3 Townsend might have tended to overlook that aspect. W48 Lam agreed that there was an element of interaction of personalities at the top management of AA. W48 Lam's opinions agree generally with the Commissioners' views.

17.20 In fact, as early as 29 May 1997, the AA Board approved the establishment of a working group to review AA's organisation and management structure post airport opening. The working group was tasked to choose a suitable consultant to carry out the proposed study. The working group was headed by W49 Mr LO Chung Hing (the Vice-Chairman of the AA Board) and had W3 Townsend, Director of NAPCO and three other members of the Board as members. The working group selected Booz-Allen & Hamilton as the consultants to undertake the study. The consultants made a report dated 20 October 1997 and their recommendations were eventually approved by the Board. When W49 Lo and W50 Mr WONG Po Yan (Chairman of the AA Board) gave evidence together, they were asked about the contents of the report, which revealed deficiencies in the leadership and teamwork of the senior management and competence of some senior managers. While W49 Lo said he did not know who the senior managers referred to in the report were, W50 Wong told the Commission that he realised that the AA management had the problems as identified. Both witnesses said that apart from introducing measures as recommended in the report, to strengthen leadership and improve co-ordination, such as asking Government to second the Director of NAPCO, W48 Lam, to be the Deputy CEO, they could not possibly afford to change any member of the top management. At that stage, which was barely about six months before the Board's target date of April 1998 for airport opening, making a change of the senior management would be too risky and the personnel problem could not be resolved in the midst of the transition from building stage to the operation stage. The Commission accepts this as a reasonable explanation and does not attach any blame to the Board.

17.21 The evidence given by the senior AA management also identifies a problem regarding the proper allocation of resources. W43 Oakervee stated that although his PD was able to get funds available for the works, it was more difficult for AMD to get resources at the early stage. W44 Heed told the Commission that AMD was a "very thin organisation". His explanation was that AMD was going to be an ongoing organisation whereas PD was there for the project, and so there was greater scrutiny on him to keep his staffing levels and costs as low as possible. A lot of what was expected of him was not achievable in a sense because there was not enough management staff to go around to do all the things required. An example of the consequence given by him was that AMD was not able to effectively oversee the preparations that ramp handling operators ("RHOs") were making for AOD. However, W50 Wong and W49 Lo told the Commission that there had not been any indication to the Board about the resources problem experienced by AMD.

17.22 While the senior officers of AA denied that there was any co-ordination and communication problem within AA, specific instances of lack of co-ordination can be identified from the testimony of W44 Heed. W44 Heed did not know that the 98.7% reliability of FIDS reported to him at the meeting of AMD general managers on 19 June 1998 only related to the availability of the host servers. He was never told before AOD that the figure did not refer to the reliability of the system. His understanding was that the system was 98.7% reliable, save perhaps the display devices and the Terminal Management System ("TMS") which was still experiencing problems. Nor was he informed that PD and GEC had agreed to defer the stress and load test of FIDS till after AOD. He was not advised about the risk of not having the stress and load test conducted before the system was put into use. Had he known these two matters, he would have inquired further with his staff and he would have realised that the risks involved in using FIDS on AOD were increased. He would have paid more attention to the reliability of the standby FIDS and the contingency plans in the case of a FIDS failure. In the Commissioners' view, there was a lack of communication and co-ordination between W44 Heed and his colleagues in his own Division and PD.

17.23 As AMD Director, W44 Heed only assessed the reliability of each of the systems to be used for AOD separately, and he never assessed the risks involved in a global manner in case of more than one of the systems failing. Had there been a global assessment, he would have realised that the contingency plan in case of a FIDS failure would require reliance on Public Address System ("PA"), Trunk Mobile Radio ("TMR")

System and most probably other communication systems such as the telephone and facsimile. Whiteboards were set up shortly after 7 am at the Departures Hall and Baggage Reclaim Hall for the passengers, but the monitors and liquid crystal display ("LCD") boards that were working provided incorrect or outdated information. The incorrect flight information shown on the monitors and LCD boards remained a source of confusion to passengers: either they relied on the incorrect information or they did not know that they should look at the whiteboards for accurate information, unless they fortuitously asked airport attendants they happened to see. PA would be required for notifying passengers of flight information, especially gate changes. TMR, conventional and mobile phones would be required by people like RHOs for operational communications. In case of a FIDS failure, flight information could only be obtained by operators of the airport community telephoning Apron Control Centre ("ACC") or Airport Operations Control Centre ("AOCC") to seek it. If they could not get through, they could attend Airport Emergency Centre ("AEC") to obtain the flight information shown on a whiteboard, an arrangement not pre-planned before AOD but only established as late as 7 pm on AOD. According to W5 Mr Allan KWONG Kwok Hung, the Operations Manager of Jardine Air Terminal Services Ltd. ("JATS") (one of the three RHOs), he attended an AA meeting at AOCC at 4 pm on AOD when it was decided the first time that whiteboards were to be put up at AEC. When the person obtained the information at AEC, he would have to use a means of communication, either telephone, TMR, mobile phone or fax, to relay that information to his own company. The demand for use of such communications systems would therefore be heavy, and arrangements should have been made before AOD to ensure that such systems were effective and efficient without overloading. W44 Heed, as Director of AMD, obviously failed to have an overall risk assessment, especially in view of the history of unreliability of FIDS, and did not work out a sufficiently careful contingency plan with members of the airport community who were required to be fully prepared in case of a FIDS failure. For this, W44 Heed must be responsible.

17.24 W48 Lam was also asked if he had made any overall risk assessment as the person in charge of the AOR programme in AA. He told the Commission that he had discussed the requirement of an overall risk planning with W44 Heed. W44 Heed told W48 Lam that he had contingency plans for each of the crucial AOR issues, and assured W48 Lam that in his expert opinion that was adequate. As W44 Heed was in overall charge of operations, W48 Lam accepted his assurance. Moreover, as there were a lot of things to be done at the time, W48 Lam did not see any justification for setting aside resources to conduct an overall risk assessment. The Commissioners feel that in the circumstances it would not be fair to hold W48 Lam responsible.

17.25 The fact that W44 Heed did not know that the 98.7% only related to the availability of the host servers and not the whole FIDS, and that the stress and load test had been deferred till after AOD involving consequential risk demonstrates a fault in communication and co-ordination within AA, contributing towards the insufficiency of planning and risk assessment in case of a FIDS failure. The two matters, if W44 Heed had known, might have served as a good reminder to him as to the importance of ensuring the availability of sufficient communication channels for the use of the airport community. The responsibility for the fault should properly be attributable to staff of AMD as a whole. That said, as the Director of AMD in charge of the operation of the new airport, W44 Heed himself must be responsible for his insufficient planning and risk assessment in case of a FIDS failure, in particular in failing to assess and analyse the reliability of the systems to be used at the Passenger Terminal Building ("PTB") on AOD as a global whole, which he admitted in evidence.

17.26 Another blatant lack of co-ordination was in the arrangements for the expert personnel of the Electronic Data Systems Limited ("EDS") (the subcontractor for FIDS) and the Preston Group Pty Ltd ("Preston") (the subcontractor providing TMS in FIDS) to be present at the new airport on AOD to assist in case of trouble being encountered by the AA operators of FIDS. Both W44 Heed and W45 Chatterjee realised that because of the late commissioning of FIDS, the on-the-job training and familiarisation for AA staff was compressed. W45 Chatterjee recommended that the contractors be asked to station dedicated resources to support AMD and IT Department whenever problems arose and to assist in the settling down of daily work. As a result, EDS' staff were on standby on AOD at additional cost. However, there was no arrangement for the experts on FIDS and TMS to be stationed at the crucial ACC where it turned out that operators did experience difficulties in performing flight swapping with TMS and with input into FIDS. Either W44 Heed, as Director of AMD responsible for running the new airport, or W45 Chatterjee who was Head of IT, or both of them, should have made satisfactory arrangements, but neither did so. Indeed, what happened was that W35 Mr Gordon James Cumming was staying all night at the EDS office close to AOCC, and W34 Mr Peter Lindsay Derrick joined him at 6:30 am, but W34 Derrick was only able to go to ACC late in the morning. On the other hand, when the operators at ACC were experiencing difficulties, W28 Mr Anders YUEN Hon Sing contacted W24 Ms Rita LEE Fung King at about 3 am but lost contact with her until sometime around 6 am. When W34 Derrick was to attend ACC, he was not able to do so because he did not have the required access permit which was eventually made available to allow his attendance at ACC at about 12:30 pm. Neither W44 Heed nor W45 Chatterjee could proffer any reasonable explanation for this failure of co-ordination, for which both of them must be responsible.

Section 3 : Overview of What Went Wrong

17.27 After the discussions in Section 2 on the organisational structure of AA and some specific instances of lack of co-ordination and communication within AA, it may be beneficial to sum up the points that the Commissioners see as being the causes internal to AA that were responsible for the chaos on AOD and the days after. A number of these causes were suggested by counsel for the Commission and have been adopted by the Commissioners after careful consideration.

17.28 There was a major problem with personalities in the top management of AA. The characters of W3 Townsend, the CEO, W43 Oakervee, a top engineer and Director of PD, and W44 Heed, an established airport manager with over 30 years of experience and Director of AMD, and their interaction have been dealt with in Section 2. These three persons played the vital role of getting the new airport ready for operation, from scratch to the construction stage, and from the completion of the works and systems to the operational sphere. Due to the preponderance given to the works side, insufficient heed was paid to the requirements of the operators who were eventually to run the new airport on AOD using the systems and facilities provided, still not fully tested. The leadership and co-ordination problem were unfortunately only exposed as late as the end of October 1997 when the Booz-Allen & Hamilton report drew the attention of the members of the AA Board to the problem. The report was commissioned because the Board decided to have a review of the organisation and management structure for the post-opening stage, not for AOR. By then, even if the Board knew which part of the senior management should be replaced, it is not possible to judge that they should have made the replacement and run the substantial risk of disrupting the senior management, and adversely affecting the transition from the works phase to the operational stage.

17.29 The delay in the construction phase had hard compressed the time that was necessary for training the operators and allowing them to be familiar with the facilities and systems that they were going to operate. The delay in the commissioning of the systems, in particular, created deficiency in the training and familiarisation, for the operators were from time to time trained with systems that were subject to change and improvement, and had to be trained again after the change or improvement had been implemented. This is also linked to the fact that many of the operators were still required to work in Kai Tak, while being given time off for training on the different operational equipment in CLK.

17.30 The involvement of AMD and IT Department in system development should have started much earlier. AMD's requirements were not given high priority until sometime in 1997 whereas IT Department, which used to be part of the Commercial Division, only became involved from late 1997 when the new airport was due to open for operation in April 1998. Had IT Department and AMD joined in the planning and design of the systems to be used for the new airport much earlier, correct or clearer functional requirements according to the users' needs would have been incorporated into the functional design specifications in the systems contracts or fed into the systems at an early stage. That would have resulted in less changes being required to be made to the systems such as FIDS, saving the development of the systems from delays for variations and providing more time for operators' training and familiarisation.

17.31 There was no planning to ensure a smooth transition from the construction stage to the operational phase of the new airport, and no experts or consultants had been engaged for that purpose. Such experts might have helped in identifying the issues that needed to be resolved and measures that needed to be implemented for a smooth transition. W44 Heed pointed out that there was no such expert, but AA had obtained some experience from a few of its staff who had been involved in opening other airports and sent staff to other countries to witness preparation for such opening. However, during the crucial stage, which should be around a year before the scheduled opening of the new airport, no expert help was engaged to concentrate on a comprehensive examination of the necessary measures to effect a smooth transition. The Commissioners accept that there may not be a single person who is qualified for such a job. A firm of consultants could have been tried or a group of experts from different sources could have been formed for the task. W43 Oakervee in evidence pointed to a firm that he was aware of, and when the Commission was looking for experts to assist the inquiry, it had quite a number of names supplied to it. W51 Mr Jason G YUEN had experience in reviewing the transition from construction to operation of airport facilities, and gave names of a few firms of consultants who were known to him to be doing this kind of work, although he did not vouch for their competence.

17.32 When the works and systems projects were completed late, and when the testing and commissioning of the systems encountered problems, there should have been an overall risk assessment. Although there were various contingency plans made, they were directed at addressing the failure of each individual system. There was insufficient examination of the negative aspects of the interaction of the failures or ill performances of more than one system. For instance, there was a contingency plan for standby FIDS to be invoked in the event of the failure of the main FIDS. However, when the main FIDS was not operating smoothly and speedily and standby FIDS was not resorted to, there were no adequate contingency measures to ensure that the RHOs would be provided promptly with necessary flight information. TMR, mobile phones and telephones were mostly working over capacity on

AOD, resulting in an inefficient passing of vital flight information. There was also insufficient co-ordination by AA with the RHOs and possibly airlines as to how to react when FIDS was not performing as it should, causing confusion and delay in the provision of services to aircraft and passengers.

17.33 Despite the lack of effective co-ordination amongst PD, AMD and IT Department, all those who were working towards preparing the new airport for operation on a fixed target date worked overtime and were fully stretched. This was mainly caused by delays in the completion of the works and systems severely compressing time left to the target date. This had at least two consequences: the yearn of those involved for achievement overbore their sense of risk and forced upon them an over-optimism, and they were left with little time to spare to step aside to look at the negative side or risks involved. The involvement of consultants on the transition from works to operation might have identified issues that could have been resolved and measures that could have been implemented before AOD to avoid the sort of situation that was the chaos on AOD. If they had advised that a smooth transition would need more time, that would have instilled a required sense of risk and insecurity into AA which would doubtless be compelled to seek a deferment of AOD. The over-confidence was not only limited to what AA could itself accomplish, but it also applied to AA's monitoring of Hong Kong Air Cargo Terminals Limited ("HACTL")'s readiness. AA took the assurance from HACTL that the latter would be ready, without having any expert opinion on the correctness of the assurance based on an examination of HACTL's cargo handling systems. AA was mainly relying on HACTL's world reputation as one of the most efficient cargo operators, gained from HACTL's long operation as such at Kai Tak and the fact that HACTL had its own reputation and business interest to look after for making SuperTerminal 1 ("ST1") ready. Had consultants been engaged to monitor HACTL's testing and commissioning of its systems, this would not only have assisted AA in assuring itself that HACTL was ready, but would certainly have helped HACTL to re-examine its own assurance more carefully.

17.34 W49 Lo and W50 Wong were asked if AA had anyone possessing the necessary expertise to monitor HACTL's systems, and both of them did not believe so. However, they told the Commission that the question was never raised in the Board and the AA management had never indicated that there were or should be doubts regarding the implementation of the HACTL systems. The Board was relying on HACTL's assurance and its position as the experienced and reputed expert in the field, and so did everyone else including the senior management of AA, NAPCO and ADSCOM. The Commissioners feel that the failure in engaging a consultant to monitor HACTL's systems was primarily the responsibility of the AA management, for they should have to satisfy themselves that HACTL was as good as its words. The AA management should have raised the point with the AA Board, and the failure to do so resulted in the non-specialist Board not considering the possibility. The responsibility of NAPCO and ADSCOM in this respect is dealt with in Section 4 of Chapter 5.

Section 4 : Misstatements and Responsibility for Them

17.35 There were two misstatements identified in the course of the inquiry, the first was that the reliability of FIDS as a whole was 98.7% available and the other was that Access Control System ("ACS") had been tested successfully. Although these misstatements were not direct causes for the chaos encountered on AOD, the Commissioners think that they had a significant bearing on the perceptions of top management of AA as discussed in this chapter. The misstatements might also have created a false sense of security in ADSCOM.

(a) FIDS

17.36 The representation made by AA to ADSCOM in ADSCOM Paper 34/98 dated 23/6/98, prepared by AA for the ADSCOM meeting on 24 June 1998 on the reliability of FIDS raised concerns on ADSCOM having been misled. The following passage is taken from the Paper:

> "Reliability tests on the present version of FIDS (Version 2.01C) commenced on 14 June and were completed on 20 June using live data from Kai Tak through the AODB. The reliability of the system as a whole has been 98.7% available; the reasons for

unavailability of some monitors and LCD boards at the 24 June trial have been identified and the problems are being rectified."

17.37 Both W45 Chatterjee and W43 Oakervee admitted that the passage conveyed false ideas, while W44 Heed did not have sufficient technical know-how as to comment. The truth of the matter is as follows:

(a) The 98.7% was of the availability of the host servers, a hardware and not a software, and not any other part of FIDS, let alone FIDS as a whole;

(b) There is a slight difference between availability which means the time when a system is operational as opposed to downtime, and reliability which relates to the soundness and consistency of the system; and

(c) The mention of the unavailability of some monitors and LCD boards implied that the only problem with FIDS preventing the achievement of 100% reliability was the monitors and LCD boards, and this implication was false.

17.38 These false ideas misled ADSCOM, for its members all understood that the 98.7% referred to the reliability of FIDS as a whole system. However, because of the prior knowledge of ADSCOM members on the continual unreliability or instability of FIDS during the various tests up to that date, they placed greater reliance on the standby FIDS that had been reported to have been successfully tested on 30 June 1998 in case of a failure of the main FIDS. The false ideas therefore had not, in the Commissioners' opinion, caused too much mischief. Yet this is something that should never have happened, as the Paper must have gone through the heads of the Divisions of AA before it was sent to ADSCOM, and the untrue statements should never have been allowed to slip through.

17.39 The genesis of the misstatement was revealed in the oral testimonies of W43 Oakervee, W44 Heed, W45 Chatterjee and W46 Bosher of AA, who together gave evidence before the Commission as a group, and by a letter from AA dated 18 November 1998 in reply to the Commission's queries regarding the matter. The letter enclosed documents in support of AA's answers, but the documents were mainly regarding the history of the AA Board Paper 183/98 dated 23/6/98 (the same date as ADSCOM Paper 34/98) which contained a similar but not identical statement, as follows:

> "Version 2.01C was loaded on 4 June as the operational system and can be used at airport opening. Progressive updates to the base FIDS system that eliminate problem reports will be installed in accordance with AMD's requirements. The reliability testing was completed on 20 June with 98.7% reliability."

17.40 As from 14 June 1998, there had been reliability tests of the host servers of FIDS, and the results showed that these servers were 98.7% available during the whole course of the tests. In a draft Board Paper prepared by or under the auspices of W45 Chatterjee on 18/6/98, it was correctly stated: "Reliability and resilience testing has been conducted. Stability of the system has improved to over 95% availability." AA Board Paper 179/98 dated 23/6/98 for discussion at the Board meeting on 25 June 1998 and prepared by PD contained a more particularised statement: "The seven day system reliability test started at 9 am on Sunday 14 June. After 4 days the commutative (sic, cumulative) availability of the host servers and display servers was in excess of 98%." While W45 Chatterjee admitted that there was a slight mistake in that only the availability of the host servers and not the display servers was tested, the passage was substantially in accordance with the facts and correct.

17.41 The first draft of AA Board Paper 183/98 was produced by Ms Pratima Patel of AMD on the basis of information provided by relevant departments and the draft was submitted to W46 Bosher. From the documentary evidence, it is clear that a draft of the relevant paragraph was based on the said 18/6/98 draft prepared by W45 Chatterjee which reads: "Good progress has been made. Progressive updates to the base FIDS system that clear operational deficiencies have been loaded. Reliability and resilience testing has been conducted. Stability of the system has improved to over 95% availability." Ms Patel circulated a draft paper incorporating W45 Chatterjee's draft passage to W46 Bosher and W44 Heed and PD for comments between 19/6/98 and 20/6/98. W45 Chatterjee also made further comments on 19/6/98 and 20/6/98, but the relevant passage remained unaltered. On 20/6/98, Mr Nigel Milligan, on behalf of W43 Oakervee suggested certain changes to the passage, stating as follows:

> "Version 2.01C was loaded on 4 June. This version can be used at airport opening. Between now and 6 July progressive versions that eliminate operational deficiencies will be installed in accordance with AMD's requirements. The reliability tests were re-started on 14 June and will run to 20 June."
> ("the penultimate version")

17.42 The penultimate version was also a correct statement, and there was no mention of the percentage. There was another suggestion of amendment of the draft from Mr Milligan on 22/6/98, but the penultimate version was untouched. The draft substantially incorporating the penultimate version was sent to W44 Heed, W46 Bosher and W3 Townsend for review and comments by Ms Patel on 23/6/98. From the drafts returned by W44 Heed and W46 Bosher, as produced by AA, although some amendments had been made to the drafts, the penultimate version again remained quite intact. From the documentary evidence, which were contemporaneous, W48 Lam seemed to have not been sent the drafts. The last person to whom the draft was sent was W3 Townsend. While W46 Bosher could not find the draft containing W3 Townsend's comments, she said in response to AA's counsel in re-examination:

> "I did make inquiries, Mr Ribeiro, but I have to say perhaps the fault is mine here, it was not my practice to keep drafts. What usually happened is that after Dr Townsend had looked at the paper and made any changes that he wanted to, he would simply walk into the next door office where I was and hand me the paper with his amendments on it."

17.43 W46 Bosher maintained on oath that the inclusion of the relevant passage was made at the very last stage of the drafting when the

Paper was cleared by herself, W44 Heed and W3 Townsend, and did not appear to have come either from IT or PD. The relevant passage in the finalised version of the AA Board Paper 183/98 is set out under paragraph 17.39 above. The penultimate version was altered in substance in two respects: (a) "operational deficiencies" became "problem reports"; and (b) "The reliability tests were re-started on 14 June and will run to 20 June" was revised to become "The reliability testing was completed on 20 June with 98.7% reliability."

17.44 The approval of ADSCOM Papers was generally co-ordinated by W46 Bosher. On some occasions, W46 Bosher produced a first draft of parts of the paper based on her understanding of the position and circulated it to persons with relevant knowledge of the particular subject for their comments, while on other occasions, relevant individuals would produce the first draft of various paragraphs comprising the paper and submit them to W46 Bosher for editing and compilation. W46 Bosher's practice was to circulate drafts to W43 Oakervee, W44 Heed, W45 Chatterjee and W48 Lam for their agreement before the paper was sent to W3 Townsend for final approval. The paper was then submitted to the Secretary for ADSCOM.

17.45 W46 Bosher disclosed that there was a draft of the ADSCOM Paper 34/98, where the crucial sentence appeared in this manner, "The reliability of the (software ?) system as a whole has been 98.7% available; the reasons for unavailability of some monitors and LCD boards at the 14 June trial have been identified and the problems are being rectified." It was she who put the question in parenthesis in the draft. Having gone through W43 Oakervee, W44 Heed, W45 Chatterjee and W48 Lam, and after their comments were collected, this draft was sent to W3 Townsend before it was finalised in the form as quoted in paragraph 17.36 above. It will be noted that the "(software ?)" which was raised by W46 Bosher was omitted in the finalised form. None of the four witnesses, W43 Oakervee, W44 Heed, W45 Chatterjee and W46 Bosher could remember what exactly happened to the draft and why the offending statement appeared in the manner as finalised or who was the person who was responsible for the finalised version.

17.46 W48 Lam was not able to identify the author of either

ADSCOM Paper 34/98 dated 23/6/98 or Board Paper 183/98 dated the same date. He denied himself being the author. His involvement in the day-to-day activities regarding the systems was limited, partly because he had no technical knowledge and partly because his sick leave only ended on 15 June 1998. As far as he was concerned, he did not know the exact meaning of the offending passage "Reliability of the system as a whole has been 98.7% available", nor did he know the difference between "reliability" and "availability". He said that as a layman, to him the two words were perhaps just the same thing, but reliability meant more certainty. He merely relied on the reports about the progress of the systems from officers of AA and the attendees at the AOR Meetings and the System Hand-Over Meetings which were mainly chaired by him. Nothing in the records of these meetings could indicate that the offending passage in the ADSCOM Paper or the Board Paper was wrong. On the contrary, in the notes of the 22/6/98 AOR Meeting, it was stated that "As FIDS is presently over 90% reliable it will be used at airport opening." W48 Lam thought that percentage related to FIDS as a whole, and he thought it meant FIDS was over 90% okay. W48 Lam remembered that at the time of the AOR Meeting, as the latest progress of FIDS was "90% okay", it was considered that FIDS would be used on AOD instead of the standby FIDS. With that knowledge in mind, W48 Lam would not have been able to discern that the ADSCOM Paper or Board Paper presented any incorrect information.

17.47 It appears from the notes of the 22/6/98 AOR Meeting that the term "90% reliability" started to creep in, and it found its way into the finalised version of the AA Board Paper 183/98 but with a higher percentage. When W3 Townsend was recalled to be given an opportunity to deal with this matter, he accepted that it was possible that he was the author of the finalised version of the Board Paper. He further said that "almost always those (the drafts) would be passed forward to me before they would be sent to ADSCOM or the Board". This tallies with the evidence of W46 Bosher and W48 Lam. From the evidence on the genesis of the Board Paper, it seems clear to the Commissioners that the finalised version of that Paper was made by W3 Townsend, because all the draft versions that had gone through W43 Oakervee, W44 Heed, W45 Chatterjee and W46 Bosher did not use the term of "98.7% reliability". W48 Lam appeared from the evidence not to have been sent the draft at the last stage, because Ms Patel addressed the penultimate draft to only W46 Bosher, W44 Heed and W3 Townsend. The penultimate version in fact did not even mention any percentage, and apparently, the finalised version was incorporating the results of the tests up to 20 June 1998 on the host servers being of "98.7% availability". The finalised version of "98.7% reliability" without the qualification that it related to host servers (and the mistakenly included "display servers") was misleading to the AA Board, and apparently also found its way into the ADSCOM Paper 34/98, although there is little evidence as to how.

17.48 There was a distinct suggestion by W3 Townsend that W45 Chatterjee, being Head of IT, would have been involved in drafting and reviewing ADSCOM Paper 34/98. W45 Chatterjee told us in evidence that he did not remember whether he drafted the offending paragraph in the ADSCOM Paper. However, in the drafts for Board Paper 183/98 that W45 Chatterjee admitted to have been originally prepared by him, the following was repeated, "Reliability and resilience testing has been conducted. Stability of the system has improved to over 95% availability." He never used 98.7% and he maintained the word "stability". The Commissioners do not believe that W45 Chatterjee was the author of the offending passage in either the ADSCOM Paper or the Board Paper.

17.49 From all the evidence, the Commissioners are satisfied on a balance of probabilities that the finalised versions of the AA Board Paper 183/98 and the ADSCOM Paper 34/98 were made by W3 Townsend, and he must be personally responsible for putting on paper the misstatement to the AA Board and ADSCOM.

17.50 W50 Wong and W49 Lo gave evidence before the Commission on their understanding of the relevant paragraph in the AA Board Paper 183/98. Both of them understood the sentence to mean that the whole FIDS was reliable to the extent of 98.7%. They had been advised by the senior management of AA that 95% reliability would be acceptable for operation. Of course, Board Paper 179/98, which was available to the AA Board at the same time as Board Paper 183/98, mentioned that tests had been conducted and "after four days, the commutative (sic, cumulative) availability of the host servers and display servers was in excess of 98%". W3 Townsend pointed out that if the Board members had read and asked questions, they would have been aware of the reference to host servers and display servers in the context of availability in excess of 98%. W50 Wong was not at the meeting on 25 June 1998, which was chaired by W49 Lo. W49 Lo told the Commission that he treated the two Board Papers to be talking about different things. He understood that the host servers and display servers were hardware of FIDS, but he felt comforted by the 98.7% reliability referred to in Board Paper 183/98 because he had been told that 95% reliability would be acceptable for operating the new airport.

17.51 There were two ADSCOM meetings following the service of the ADSCOM Paper 34/98 before AOD, on 24 June and 4 July 1998. W45 Chatterjee clarified that the ADSCOM meeting on 24 June 1998 took the form of a walk around as the ADSCOM members were visiting PTB to observe the building and facilities on the ground, and there was no specific discussion about the offending paragraph. Indeed, apart from some tables and lists prepared for ADSCOM members, no notes or minutes as to what was said and by whom were kept for that meeting. Both W45 Chatterjee and W46 Bosher who attended the ADSCOM meeting on 4 July 1998 told the Commission they did not remember the figure of 98.7% being mentioned at the meeting. The evidence tallies with the memory of W36 the Chief Secretary. On the other hand, W3 Townsend said when he first gave evidence on Day 10 that after the Paper was provided to ADSCOM, the matter was mentioned subsequently with ADSCOM and he did not think ADSCOM was misled. This he subsequently withdrew when asked on Day 48 at his recall to the witness box. Anyhow, the notes of the ADSCOM meeting on 4 July 1998 recorded no reference to this figure. Rather, the following was the only record on FIDS:

> "5. On FIDS, HIT/AA (ie, W45 Chatterjee) reported that the permanent FIDS continued to be stable. FIDS had been running continuously since 22 June and with Airport Management Division's permission, there had been controlled bring-downs to update the software. HIT/AA said that there would be workarounds when a function of the system went down, and the workarounds had been tested and found to work well.

6. The switch over from permanent FIDS to the standby had also been tested on Thursday last with the assistance of 35 airlines. Within 30 minutes, most displays were switched on. HIT/AA confirmed that that was acceptable from the operational point of view. During the switch over, the information displayed on the LCD boards and monitors would become out-dated. To remedy the situation, the Public Address system could be used to disseminate up-to-date information.

7. HIT/AA explained that during the workarounds, the system would be in the permanent FIDS environment. AA would try to re-boot the system. Meanwhile, white boards and extra hands would be available to help with directing the passengers in the problem area. Such happenings were not uncommon in an operating airport."

17.52 The statements recorded as made by W45 Chatterjee concentrated more on the reliability of the standby FIDS and the workarounds, and there was no mention of the 98.7% figure. This reasonably contemporaneous record of the meeting is consistent with what W36 the Chief Secretary told the Commission from her memory and corresponds with her evidence that she did not place too much reliance on the figures, but focussed more on the success of the testing of the standby FIDS that was reported to have taken place on 30 June 1998. Coupled with the evidence of both W45 Chatterjee and W46 Bosher that they did not remember the figure being mentioned at the 4 July meeting, the Commissioners are satisfied that the evidence of W36 the Chief Secretary, W45 Chatterjee and W46 Bosher is to be preferred to that of W3 Townsend who, when cross-examined on Day 10 with what was said by way of explanation of the figure, could not point out anything specific. At his returning to be questioned again on Day 48, W3 Townsend withdrew his previous evidence that the matter was subsequently discussed. The Commission finds that the misstatement that FIDS was 98.7% reliable as a whole was made to ADSCOM and no clarification of its true meaning was ever proffered to ADSCOM members. W3 Townsend was probably the author. He was present at the ADSCOM meeting on 4 July 1998 and knew that this statement was contained in AA's ADSCOM Paper 34/98 and that it was either misleading or untrue, but he did not disabuse ADSCOM members of the false meaning. W45

Chatterjee who was also at the meeting should have appreciated the falsehood in the offending passage. He would certainly have read the paper before attending the important meeting and been aware of the vast discrepancy between the wording and meaning of the offending passage and those contained in his own drafts for the current Board Paper. After all, he had the specific responsibility to monitor the progress of FIDS. Yet he did not point out the mistakes to the meeting either.

17.53 The Commissioners have considered hard as to whether there was intent to mislead on the part of W3 Townsend. He testified that it was more a matter of editing the paper than any deliberate attempt to present any confusing information. The Commissioners come to the conclusion that the evidence is not weighty enough for an inference to be drawn that there was clearly an intent on W3 Townsend's part to mislead ADSCOM. They are of the view that at least both W3 Townsend and W45 Chatterjee were grossly negligent in allowing the misstatement to remain unexplained at the ADSCOM meeting on 4 July 1998. From the evidence of W36 the Chief Secretary, it appeared that she placed more reliance on the availability of the successfully tested standby FIDS, and it appears that even if she and other members of ADSCOM had been told the true meaning of the 98.7% figure, little difference would result in the deliberation by her and her colleagues on the readiness of the new airport to open on AOD. Nonetheless, had they known the true meaning of the figure, ADSCOM members might have considered to impress upon AA that the standby FIDS should be used for AOD instead of the main FIDS, in view of the relative reliability of the former system. That is, however, a purely hypothetical matter.

(b) <u>ACS</u>

17.54 ACS is the acronym for the Access Control System. The 184th ADSCOM meeting on 6 June 1998 was chaired by the Financial Secretary and attended by W3 Townsend, W44 Heed and W45 Chatterjee, amongst others of the senior management of AA. The notes recorded that after W45 Chatterjee reported to the meeting that tests of some of the systems had been successfully concluded,

> "CEO/AA (ie, W3 Townsend) added that the four key safety and

> security systems – access control, fire alarm, closed circuit television and public address system had also been successfully tested. They were at the moment busily engaged in issuing access cards."

17.55 In fact, in the PD's Construction Monthly Report for May 1998, but with information up to 8 or 9 June 1998, it was reported on ACS that

> "The installation process has been improved with more doors installed. A programme with forecast door security energisation dates from the PTB is now being reviewed. There is still however a serious concern at the lack of engineering resources to commission to core system and to resolve engineering problems which neither Guardforce nor their subcontractor seem willing to address."

17.56 W43 Oakervee explained to the Commission that although Guardforce Limited was the ACS contractor, the software was provided by the subcontractor, Controlled Electronic Management System Limited in Belfast whom AA had difficulty in getting to come out to Hong Kong to address the engineering problems. W43 Oakervee said that ACS was a serious concern because it "was such an important subject that Mr Heed, Mr Siegel and I and Billy Lam all had … our attention and minds focused completely on it. … Dr Townsend would have known also. … it was a key aspect … that … it hinged about the issue with the aerodrome licence." By the time of the ADSCOM meeting on 6 June 1998, the problems had not yet been fixed, and indeed, up to the day when the four senior officers of AA gave evidence together before the Commission, ACS problems had not yet been fully rectified. In view of the clear concern expressed in the said Construction Monthly Report, W43 Oakervee agreed that the statement of W3 Townsend to ADSCOM at the meeting of 6 June 1998 was incorrect. W44 Heed also testified that the falsity of W3 Townsend's statement at the meeting was also obvious to him. W44 Heed said in evidence that ACS related to security within the airport for which his AMD had overall responsibility and that ACS was not in a position to be used yet and he knew that there were a lot of problems with the system. W45 Chatterjee was at the meeting but did not utter anything openly or do anything in any inconspicuous way to correct W3 Townsend there and then, nor afterwards intimated to him that he had made a mistake. The untruth was allowed to be unclarified before all the attendees of the meeting. This is inexcusable. W45 Chatterjee explained that he was not specifically responsible for ACS as opposed to FIDS, and he had not followed ACS to that level of detail. At the said ADSCOM meeting, he had just finished explaining about FIDS when W3 Townsend remarked about the successful tests of ACS and he therefore did not make a mental connection with ACS.

17.57 W48 Lam also attended the ADSCOM meeting held on 6 June 1998. However, his knowledge on ACS at the time was quite limited. The following is a summary of the information relevant to ACS he received at the System Hand-Over Meetings and the AOR Meetings at the end of May and early June 1998, as evident from the notes of those meetings:

(a) At the AOR Meeting on 25/5/98, it was reported that fire detection system tests were ongoing, that ACS was 95% ready and still on target for hand-over at the end of the month, and that Aviation Security Company Limited was working alongside at workstations on training. It was also recorded that W48 Lam said that it was absolutely essential that ACS be ready for testing of the permit system by 1 June for the Enhanced Security Restricted Area to start function by the 14 June airport trial.

(b) At the System Hand-Over Meeting on 28/5/98, a representative of PD confirmed that major software problems encountered with ACS had been overcome and the SAT would be carried out the week following to be completed by 5 June.

(c) At the AOR Meeting on 1/6/98, it was reported that takeover of ACS was scheduled for 1 June.

(d) At the System Hand-Over Meeting of 5/6/98, a representative of PD confirmed that the SAT for ACS could be completed by

> 8 am on 8/6/98, and was confident that majority of the system functionality would be ready for operation.

It can be seen that with the above information in mind, it did not appear to W48 Lam that the information on ACS given by W3 Townsend at the ADSCOM meeting of 6 June 1998 was misleading.

17.58 During cross-examination, W44 Heed never denied that he was at the ADSCOM meeting of 6 June 1998. He admitted that he knew that what W3 Townsend said about ACS was not true, but he did not correct him. His explanation was that he did not think that it was his place to speak up on that occasion, that it would border on insubordination, that there were others at the meeting who knew the true situation, and that his role at the ADSCOM meeting was to support W3 Townsend if he was asked any questions by ADSCOM members. W44 Heed said that he merely let the matter pass, not having a private word with W3 Townsend, nor did he think it necessary to do so for W3 Townsend should have known the situation. The following exchange between counsel for the Commission and W44 Heed is important and indicative of the witness's attitude:

> Q: So it does not matter that the Financial Secretary was misled because other people did not bother to correct Dr Townsend; is that right?
>
> HEED: Yes, that is right, yes.

17.59 W3 Townsend was recalled by the Commission to be given an opportunity to answer the allegation of falsehood against him. He agreed that "from the vantage of hindsight I probably should have elaborated more on that particular point and been more specific", and "I feel that perhaps further detail may have been appropriate." His explanation was that "time was valuable in those days, and generally we would go through the programmes at the ADSCOM meetings in a timely way, so it lent itself towards trying to summarise various points that had been recorded in the papers." He denied having an intent to give false information.

17.60 As with the misrepresentation of the 98.7% reliability of

FIDS as a whole, the Commissioners have not been able to find sufficiently weighty evidence to sustain a finding of wilful intent on W3 Townsend's part to mislead ADSCOM about the progress of ACS. Nonetheless, the Commissioners find that W3 Townsend must be the main culprit in making the misstatement to ADSCOM. As far as W45 Chatterjee is concerned, after evaluating his testimony, the Commission feels that it might be unfair to him to hold that he should have disabused ADSCOM of the misleading statement. Quite unlike his position vis-à-vis FIDS, he was not specifically responsible for the development of ACS and he was concentrating on explaining to the meeting about other systems, immediately after which, W3 Townsend made the untrue remark about ACS. There may be some truth in W45 Chatterjee saying that he was not mentally alert about ACS in the circumstances.

17.61 The admitted involvement of W44 Heed in not providing any clarification of W3 Townsend's misleading statement at the ADSCOM meeting on 6 June 1998 took a strange turn when W48 Lam gave evidence. W48 Lam said that it seemed to him that W44 Heed was not there at the meeting. As a result, the notes of the ADSCOM meeting were carefully checked and it was discovered that while W45 Chatterjee was present when W3 Townsend made the statement, W44 Heed joined at a later juncture upon W45 Chatterjee leaving the meeting. Had this been pointed out to W44 Heed when he was giving evidence, he would not have been subjected to the cross-examination, which revealed his attitude towards the matter. As he was not at the meeting when the statement was uttered by W3 Townsend, W44 Heed cannot be responsible for not making any attempt to point out the incorrectness or mistake of the statement to W3 Townsend or more importantly to ADSCOM. What is damnable is that he saw himself at such a meeting merely to support the CEO, W3 Townsend and to respond to questions put, but not bothering if ADSCOM was misled. In the opinion of the Commissioners, he was unbecoming of his position as a member of the senior management of a large organisation such as AA. W44 Heed told us that W3 Townsend must know that the statement was incorrect, and it was therefore not for him (W44 Heed) to point out the mistake. From the answers given by W44 Heed, there were perhaps several explanations for his taking such a stance. He might be (a) too submissive to his boss; (b) too loyal to him; or (c) too embarrassed to point out his mistake.

Whatever the reason, his attitude is reproachable, because he would allow his boss to state an untrue fact to ADSCOM in the course of its being apprised of AOR critical issues, and did not mention to W3 Townsend that he had made a mistake at or after such an important meeting. Even W3 Townsend did not seem to approve, as he had this to say: “I am also, I might add, rather surprised that Mr Heed … did not speak up at the meeting, because it was a special review meeting, people were normally encouraged to express different opinions.” Both W49 Lo and W50 Wong said that W44 Heed’s attitude was inappropriate in the circumstances. Albeit W3 Townsend was the main culprit in the act, W44 Heed’s own evidence exposed an attitude unbefitting of his senior position, and not worthy of the trust that ADSCOM must have placed in him such that it invited him to attend its meetings from time to time. His attitude makes it doubtful that he should be entrusted with the important task of being in charge of the management and operation of the new airport. One may argue, however, that being a very experienced airport manager, he must be up to the job. That may very well be the case, but the doubt as to his appropriateness relates to his integrity and attitude towards his responsibility which were only revealed because he did not deny that he was present at the ADSCOM meeting on 6 June 1998 at the crucial moment. At the very least, his attitude makes it doubtful whether he could properly handle matters in a crisis or delicate situation.

17.62 The Commissioners have also considered the two misleading statements from a broader perspective. In evidence W43 Oakervee, W44 Heed and W45 Chatterjee all viewed that 6 July 1998 was a target date that all had to work towards, although that date was not irreversible in case any major item of AOR could not cope. Everybody was working extremely hard with a view to making that date successful, and focussing on all the AOR critical issues. None ever thought of having the date deferred. All were thinking of fulfilling AOR on AOD and bearing the burden or pressure while aiming at making the opening a success. They admitted that because of all these factors in the prevailing circumstances, as W43 Oakervee described their being “in the box”, they might have been over optimistic as to what they had achieved, rather than critically examining the risks involved in the things that they had not completed. They were too involved with the goals in their own sphere, “driving ahead with each of” their own domains (W43 Oakervee’s words) and "because of the workload … did not have the opportunity to step outside" their bounds (W45 Chatterjee's evidence). They never took a step aside to look at the situation as a critical outsider. They subconsciously viewed the facts known to them on the bright side, to bolster up their confidence and belief that AOD was manageable, and this confidence had a vital influence on their presentation of the facts and their views to ADSCOM. They did not feel they were painting too rosy a picture for ADSCOM, for they were lulled by their own self-induced confidence and sense of achievement rather than dishonestly misleading ADSCOM. The Commissioners feel that there is a certain ring of truth in this, and agree that W3 Townsend should be responsible for his truly held false confidence and belief in allowing ADSCOM to be misled about the 98.7% and about the status of ACS, rather than for wilfully misleading ADSCOM. The others like W44 Heed and W45 Chatterjee were also too immersed in the drive to accomplish and too imbued with the sense of optimism somewhat forced upon them by the circumstances to pay sufficient heed to reality. They were thus susceptible to adopting and acquiescing in views that were swayed from the facts.

17.63 The misrepresentations to ADSCOM and to the AA Board made by W3 Townsend as the most senior person in the AA management are most deplorable. It is clear that he put the misrepresentation of 98.7% reliability in the AA Board Paper, and more probable than not that he put the misstatement of 98.7% as being the reliability of FIDS as a whole in the ADSCOM Paper that AA presented to ADSCOM. Moreover, his making the untrue statement about ACS face to face with ADSCOM members has been proved beyond reasonable doubt. As the CEO of AA, who had the duty to plan, develop and operate the new airport, and therefore to make it ready for operation on AOD, he betrayed the trust that was reposed in him by both the AA Board and ADSCOM, especially regarding AOR critical issues. While it is unfortunate that none of his subordinates were able to correct his mistakes, it remains that he must personally be held responsible for what he has done. Indeed, viewing it from another angle, he had created the circumstances which dragged W44 Heed and W45 Chatterjee, his unwitting and unwise subordinates, into the blame and disrepute that he should otherwise properly face all by himself.

Section 5 : Responsibility

17.64 Whilst Sections 2, 3 and 4 deal with an overview of the responsibilities of various persons under their respective headings, this section specifically deals with the responsibility of the top AA management and the AA Board.

17.65 The Commission finds that the AA management failed to maintain a right balance between PD and AMD in two ways. First, AMD's participation in project and systems development was not provided for in an early stage. W43 Oakervee told the Commission that PD did not have a client, in the sense that PD did not work towards the requirement or satisfaction of anyone. W44 Heed as Director of AMD lamented that "that client should have been there in 1992 not 1994", emphasising the lateness of AMD's involvement in the project development stage. W48 Lam, the Deputy CEO who joined AA in January 1998, also agreed. He said:

> "…we should have somebody from the user's point of view, from the operational point of view, who could feed back the user's requirements to the Project staff from the very start … that means there is no consistent stream of feedback from the user's angle, and that partly means that some of the user's requirements or operational requirements were not fed into the system or were not given loud voices at the very beginning."

17.66 AMD was the ultimate operator of the new airport, and it is obvious that the operator's input ought to have been sought from the beginning, but it was not done. This resulted in AMD's requirements not being fully taken into account during systems development. A glaring example is that the particular technical specifications ("PTS") used for the tendering of the contract for FIDS were not prepared by AMD or in full consultation with AMD. As a result, the PTS based on which GEC and its subcontractor EDS took up the contract did not represent fully or sufficiently AMD's needs, and the FIDS software programme had to be written from scratch. This caused a delay in the development of FIDS of about 14 months and payment of $89.7 million to the contractor for the aborted and variation works.

17.67 Secondly, the personalities of the persons occupying key posts caused problems. This has been discussed in detail in paragraphs 17.18 and 17.28 above.

17.68 For the purpose of the inquiry, the acts and omissions and therefore the responsibilities of the following persons in the top AA management have been examined in detail, namely, W3 Townsend (the CEO), W48 Lam (the Deputy CEO), W43 Oakervee (Director of PD), W44 Heed (Director of AMD) and W45 Chatterjee (Head of IT).

(a) W3 Townsend

17.69 Under the AA, the CEO was responsible for the general management and administration of AA's affairs: the Airport Authority Ordinance section 15(1)(b)(i). Prior to AOD, that duty must include both construction and operational readiness of the airport, as W50 Wong and W49 Lo stated in evidence. One would therefore reasonably expect that the CEO of AA, the person in charge of the construction and operational readiness of the airport, would be sufficiently experienced in airport construction or at least airport management to enable him to discharge that duty properly.

17.70 However, as the Commission has heard from W3 Townsend, prior to his appointment as the CEO (then with the Provisional Airport Authority) he had no experience with airport management or construction. There is therefore some truth in W48 Lam's assessment that W3 Townsend's engineering background and lack of experience in airport management would be a reason why operations were overlooked.

17.71 From the totality of the evidence presented to the Commission, it is more probable than not that W3 Townsend was not up to the task entrusted to him. The relevant comments by various persons as recorded in documents are set out hereunder for ease of reference:

(a) At the ADSCOM meeting on 7/11/97, it was recorded: "DCA had no faith in the top management of AA. The project was driven by PD/AA who always tried to bulldoze his way through. CEO/AA was not in control and the organisation was not functioning as it should."

(b) In the Chairman's Brief for the 7/11/97 ADSCOM meeting, W48 Lam (then Director of NAPCO) reported that: "On the other hand, Chern Heed still allows himself to be pushed around and CEO/AA is not backing him up. There is talk to get Clinton Leeks to take over the training and trial programme and Howard Eng to underpin Chern Heed; this has yet to be confirmed."

(c) At the same ADSCOM meeting, the following discussion was minuted: "On systems, there was no one within AA who was experienced in this field. On operations, despite some experienced airport management staff, especially those from Kai Tak, there was no one within AA who had experienced the transition of an airport from the construction to the operational phase. NAPCO had some (International Bechtel Company Ltd.) staff with such experience and he was thinking of 'seconding' them to AA, to help take things forward. DCA pointed out that there was staff in AA who had worked in Kai Tak. The unfortunate thing was that these staff had no clout to ensure that things that should be done were in place."

17.72 In ADSCOM Paper 34/97 of 19/9/97, NAPCO made the following recommendations to ADSCOM:

> "We find that co-ordination within the AA itself, particularly between AMD and the Project and Commercial Divisions, as well as co-ordination and cooperation between the AA, Business Partners, Government and all others requires intensified attention and immediate improvement. The 'matrix' organisational split of AOR responsibilities between the various AA Divisions is not functioning efficiently, and information and decision-making 'bottlenecks' exist. We also find that programme and other essential information is (sic) not

fully shared between the AA and Business Partners. We recommend herein that a single-point responsible high-powered executive manager be vested with requisite and clear authority to direct the AOR process and dictate action inclusive of all participants - AA (including all Divisions), Business Partners and Government. We further recommend that a full 'open book' approach to co-ordination and information sharing be implemented immediately inclusive of all participants."

17.73 The Commission accepts the submission of counsel for the Commission that the very fact that NAPCO had to make such recommendations showed that:

(a) W3 Townsend was not in control of and not able to co-ordinate the various divisions;

(b) The AA management, under W3 Townsend, was not able to co-ordinate and cooperate with business partners and Government;

(c) W3 Townsend's management style did not work; and

(d) Although he was the CEO, W3 Townsend was not able to play the role of the "single-point responsible high-powered executive" to direct the AOR process efficiently.

17.74 The evidence therefore points quite clearly that W3 Townsend was not in control of the management, resulting in lack of co-ordination between the PD and AMD. He did not give sufficient priority and adequate support to operational requirements of AMD, especially since the end of 1997 when more preponderance should have been accorded to AMD in the transitioning of the project stage to the operation sphere. He did not assign sufficient resources to AMD at an early stage, and failed to give sufficient support to W44 Heed, who was frustratingly left with a FIDS that was not fully ready and with compressed time for training and familiarisation for his staff. He did not engage an expert to monitor HACTL's systems (see paragraph 17.34). All these ultimately resulted in the deficiencies in the operational readiness of the airport. In addition to his general inability to maintain proper control over the management, as the CEO, W3 Townsend must bear overall responsibility for the failings of the senior management. In particular, he must be responsible for failing to have any or any proper global assessment of AOR (including ensuring sufficient contingency measures had been put in place) or the risks involved in opening the airport on AOD with incomplete critical systems. He is further responsible for the misstatements he made to the AA Board and ADSCOM referred to under Section 4 above.

(b) W48 Lam

17.75 W48 Lam has been found by the Commission not to be responsible for the problems witnessed on AOD, or for the lack of communication and co-ordination or for the misrepresentations. The details of the review of his involvement in various issues can be found in paragraphs 17.24, 17.42, 17.46, 17.47 and 17.57 above. In fact, he was disabled by an accident on 12 March 1998 and did not resume his duties as the Deputy CEO until 15 June 1998 (see paragraph 17.17). He was in charge of the mammoth relocation exercise, the major phase of which took place in the night between 5 and 6 July 1998, and the Commission has not received any complaint on this score.

(c) W43 Oakervee

17.76 W43 Oakervee showed himself to be a straightforward witness. His strong and aggressive character is borne out not only in the documentary evidence but also when he was giving evidence before the Commission. Though unfortunately these attributes of W43 Oakervee operated unfavourably towards the composition of the senior AA management and the interaction amongst the personalities occupying the AA top posts, the Commissioners have the impression that they worked very well for him in the position of the PD Director. However, there were various slippages of the construction and systems programmes, which even W43 Oakervee was not able to eliminate.

17.77 In a letter dated 8 January 1999 to the Commission, W44 Heed responded to various allegations against him. At paragraph 5 of the letter, he stated as follows:

> "…the responsibility to provide the airport facilities and systems and have them ready for AOD resides with the Authority's Project Division. None of the facilities and systems on AOD were accepted from the contractor. Although official hand-over for use by AMD for some systems, i.e. lifts, escalators, etc. had taken place, others were being used by AMD because they were required. However, the responsibility for these systems, i.e. ACS, PA, chillers, etc. rested with Project Division and their contractors."

17.78 Reading this quote from W44 Heed's letter and with W43 Oakervee's express acceptance of responsibility in his testimony, it is clear to the Commission that W43 Oakervee and PD which he heads must be primarily responsible for the slippages and the unreadiness of facilities and systems. Nonetheless, the Commissioners consider that slippages in construction programmes are almost unavoidable, and in view of the fact that there is no evidence that W43 Oakervee failed in his duties as Director of PD, the Commissioners do not think that too much blame should be attached to him.

(d) <u>W44 Heed</u>

17.79 The AMD, being responsible for the management and operation of the airport, is primarily responsible for the problems and shortcomings witnessed on AOD. W44 Heed, as the Director of AMD, must take the major share of the blame, despite his pleas in the above-mentioned letter dated 8 January 1999. The unreadiness of the facilities and systems will be discussed later. W44 Heed's personality was too weak as compared with W43 Oakervee's and he did not have the support of W3 Townsend. His inadequacies and weakness contributed to the problems encountered on AOD.

17.80 First, as the director of AMD, W44 Heed ought to have stood firm vis-à-vis PD, in particular his counterpart W43 Oakervee, to ensure that AMD would have sufficient time to get properly prepared for AOD. When he was cross-examined by counsel for the Commission, he conceded that it was partly true that he had allowed himself to be pushed around and that the CEO was not backing him up. His weakness in itself would not have been too much of a problem and might even have helped his relationship with his subordinates, but was problematic when interacted with W43 Oakervee's strong character. This was apparent from the following exchange in W43 Oakervee's cross-examination on the hand-over of the FIDS, ACS and PA from PD to AMD:

> COUNSEL Q: But you heard Mr Heed say that he had no alternative. Do you blame him for taking over the systems? Do you blame Mr Heed for taking over the systems when they were not really fully tested and commissioned?
>
> OAKERVEE: I do not blame anybody. It was entirely Mr Heed's choice as to whether he did it or not.
>
> Q Would you say that he should speak up and say: "I am not going to accept them"?
>
> A I cannot speak for Mr Heed.
>
> DR CHENG: If you were in his position, would you have done that?
>
> A Bearing in mind that I have no knowledge of running an airport, I may have been a bit more aggressive, yes.

17.81 W48 Lam also told the Commission of occasions when W44 Heed was too shy to make his points across to W43 Oakervee, and W48 Lam had to call up W43 Oakervee to intervene and ask W44 Heed to put down his views in writing.

17.82 Secondly, W44 Heed failed in his duty to ensure that he was kept properly informed of the progress of the FIDS development so as to enable him, as head of the AMD, to make an informed assessment as to the readiness of the FIDS for AOD. In this connection, he has failed in at least three major respects:

(a) He failed to ensure that AMD would be consulted on major decisions and stages in the programme which might have repercussions on operational readiness of the airport. For example, he let the "point of no return" (having stand-alone builds or one integrated build of FIDS) pass by without even knowing it. W42 Mr NG Ki Sing, the General Manager (Terminal Operations), said that AMD did not find out until February 1998 that the point of no return had already past.

(b) He failed to ensure that he had a proper and accurate understanding of the statistics about the "reliability" or "availability" of FIDS given to him towards the end of June 1998 when a decision had to be taken as to whether to use FIDS on AOD. He thought that figures of "over 90%" and "98.7%" reliability reported by IT referred to the reliability of the whole system, whereas in fact the figures only referred to the up-time of the host servers and did not include the software. As a result of his ignorance, he made an erroneous report to W48 Lam on the reliability of FIDS by stating in his memo dated 19/6/98 that "At yesterday's systems meeting a review of the reliability of the FIDS was discussed. Although the FIDS reliability tests indicated 97-98% reliability, the TMS stand allocation module is not to the standard for operational use." His decision to use FIDS on AOD was therefore made on a wrong basis.

(c) He did not even know that a decision had been made sometime between 19 and 22 June 1998 to defer the stress test for FIDS. Needless to say, he was not advised of the risks involved in going ahead with the main FIDS without having a proper stress test.

17.83 The result of the above failures on W44 Heed's part translated into the absence of any proper assessment of the risks involved in using FIDS on AOD. As the head of AMD, he cannot possibly escape responsibility.

17.84 Thirdly, as an experienced airport management professional, he ought to have ensured that an appropriate overall risks assessment was carried out during June at the latest so as to assess the risks involved in proceeding with the opening as scheduled and the sufficiency of contingency measures. In his letter of 8 January 1999, he prayed in aid the fact that the facilities and systems that had been handed over to AMD for operation on AOD had not yet been accepted by AA from the contractors, to show that these matters were the responsibility of PD and not AMD. While the Commissioners accept this submission, the unprepared states of the facilities and systems highlight the importance of having a very careful overall risk assessment and global contingency plan. W44 Heed admitted that no such assessment had been undertaken, as it ought to have been, according to W48 Lam. W44 Heed also admitted that there was no global contingency plan. Had such exercises been carried out, the state of unreadiness of FIDS, the insufficiency of contingency measures and lack of co-ordination with other operators like RHOs might well have been revealed and remedied or at least reduced before AOD. As a result, when FIDS failed on AOD, vital lines of communication were either not available or overloaded, the airlines and RHOs found themselves completely lost without vital flight information, and chaos ensued.

17.85 In his letter of 8 January 1999, W44 Heed laid great emphasis on the insufficiency of resources available to AMD. He said:

> "I point this out to put in perspective the amount of resources that were available to accomplish the workload as undertaken and the limitations to take on much more."

He also revealed that when four senior experienced general managers were taken away from AMD in 1997, which was disruptive to the staff and impeded AMD's ability to maintain the momentum on the many initiatives under underway, his expressed concerns led to the assignments of Mr Howard ENG as Deputy Director and Mr K W TONG as General Manager, Engineering and Maintenance. If there was truly a resources problem that caused AMD to be unable to carry out the tasks entrusted to it effectively, concern should have been raised by W44 Heed with W3 Townsend or with the AA Board for provision of adequate resources, and if they were not forthcoming, then it would be for W44 Heed to warn them of the high risks in attempting to operate the new airport on AOD or even suggest a postponement of AOD. To support this warning, it would behove W44 Heed to have an overall risk assessment, or to make a global contingency plan in case the warning was not heeded. W44 Heed admitted that he had done neither. There is little evidence to show that these two exercises would have demanded too many resources. Moreover, W50 Wong and W49 Lo told the Commission that they were never apprised of lack of resources for AMD to carry out its functions. It is now too late after the events on AOD for W44 Heed to harp on inadequate resources which should have been boldly mentioned by him to the CEO or the Board at the right time. The absence of documentary evidence on urgent and serious requirement of resources for AMD also goes to show W44 Heed's weak character referred to in paragraph 17.18 above.

17.86 In the end, the Commission finds that W44 Heed's weakness and deficiencies deprived Hong Kong of the chance of a smoother and more efficient airport on AOD. Additionally, his failures to discharge his duties materially contributed to the mayhem and confusion witnessed on AOD.

17.87 W44 Heed's integrity is doubted in his attitude towards ADSCOM. This matter is covered in paragraph 17.61 above.

(e) W45 Chatterjee

17.88 IT, headed by W45 Chatterjee, served a supportive role to PD and AMD. IT was actively involved in the FIDS programme as from about December 1996 when PD required support on testing and commissioning of the systems contracts. A task force was set up around 20 December 1996 to support PD in the testing and commissioning of the systems, including FIDS. This task force reported to W44 Heed and Mr Raymond LAI (Director, Financial and Commercial). Its role was to "act as AMD's expert technical representatives working with the PD to ensure that the technical operational aspects of the infrastructure systems were fully tested".

17.89 The Commission finds that W45 Chatterjee, as Head of IT, failed in his duties in two respects: (1) not properly assessing the risks involved in deferring the stress test for the FIDS; and (2) not properly advising the AMD of the risks involved in not undergoing such test before AOD.

17.90 The lack of proper testing of the FIDS in detail can be found in Chapter 13. The evidence of W21 Mr Michael Todd Korkowski, W35 Cumming and Mr Rupert John Edward Wainwright of EDS, W22 Mr Edward George Hobhouse of GEC, W34 Derrick of Preston, W55 Dr Ulrich Kipper and W56 Professor Vincent Yun SHEN (the Commission's IT experts) all points to the importance of testing in software development and commissioning, and emphasis is laid on a stress test being able to reveal problems. The evidence is also clear that the stress test for FIDS was deferred because of the lack of time. There were 38 problem reports ("PRs") identified in early June 1998, and the witnesses from the parties including those from NAPCO seemed all to agree that the time remaining up to AOD should better be used to rectify the PRs and that FIDS was not in a stable enough state to be subject to a stress test.

17.91 It is necessary to decide first whether W45 Chatterjee ought reasonably to have appreciated the risks involved. From the evidence, it appears that the risks were clear and significant, yet they were not recognised by W45 Chatterjee fully or at all. The reasons in support are as follows:

(a) It is industry practice to carry out stress testing for an important system like FIDS. The deferment of the stress test was therefore a major deviation from that practice. The evidence from various witnesses who were IT professionals and experts, including W45 Chatterjee himself, is that a stress tests would probably have revealed the performance problems of FIDS and the extent of such problems.

(b) The major reason given by witnesses on the postponement of the stress test was that FIDS was not stable enough to undergo a stress test. Hence, the danger of using the system for Day One operation must have been evident to someone with W45 Chatterjee's IT background. Yet apparently this risk did not receive the attention it deserved.

(c) Given the less than smooth software development and testing of the FIDS, W45 Chatterjee should have been on the alert to ensure that the system would be up to scratch for live use on AOD. In particular, as there were many open PRs up to AOD with some 38 major outstanding PRs having been identified in June 1998, W45 Chatterjee must have been aware that for AOD, the system was at best functional on workarounds if at all. Moreover, W45 Chatterjee should have known that not having conducted a proper stress test due to the lack of time, problems which would otherwise have been revealed might crop up only during live operation on AOD. Bearing these two factors in mind, it is difficult to see how W45 Chatterjee could have failed to appreciate the very serious risks involved in going ahead with FIDS on AOD.

(d) If and insofar as W45 Chatterjee did not have the necessary expertise to provide a proper assessment of the risks involved, outside expertise, for example CSE International Ltd ("CSE"), the systems consultants retained by the AA management, should have been sought.

17.92 As to the second question, namely, whether W45 Chatterjee should have advised AMD of the risks involved in not undergoing the stress test before AOD, the answer must be clear. AMD being the operator of FIDS on AOD needed a full picture of all relevant factors so as to be able to come to an informed decision on whether to use FIDS on AOD, and to plan for the necessary contingency measures in the event of serious problems impeding operation.

17.93 W45 Chatterjee confirmed in testimony that he did not advise W44 Heed or even W48 Lam of the difference between a formal stress test and the fifth airport trial as a "test" of the loading on AOD, nor the decision to defer the stress test. Thus neither W44 Heed, as director of AMD, nor W48 Lam, the Deputy CEO and chairman of AOR Meetings, was advised of the risks involved.

17.94 No doubt AMD shared in the responsibility in that it should also have taken steps to find out for itself the relevant information, but

W45 Chatterjee as Head of IT and being in charge of the task force to report to AMD on testing must take the major portion of the blame for not advising AMD properly. This is another demonstration of lack of co-ordination within the AA management.

17.95 Counsel for the Commission also submitted that W45 Chatterjee made two misrepresentations, namely,

(a) The misrepresentation contained in ADSCOM paper 34/98 where it was reported that "The reliability of the system as a whole has been 98.7% available…"

(b) That he reported at the ADSCOM meeting of 4/7/98 that the standby FIDS had been satisfactorily tested with 35 airlines on 30 June 1998.

17.96 The first misrepresentation has been dealt with in great detail under Section 4 of this chapter, and the Commissioners find that W45 Chatterjee was grossly negligent in allowing it to remain unexplained at the ADSCOM meeting on 4 July 1998 (see paragraph 17.53).

17.97 On the other hand, there is no sufficient clear evidence for the Commissioners to find that the report made by W45 Chatterjee about the successful or satisfactory test of the standby FIDS on 30 June 1998 contained untruth when what he told ADSCOM is carefully analysed. Counsel's allegation is mainly based on airlines' responses to the Commission that they did not know standby FIDS was tested at the trial on 30 June 1998 in which they took part. The Commissioners consider that such evidence does not necessarily falsify W45 Chatterjee's statement to ADSCOM. First, the airlines and their handling agents did take part in a trial held on 30 June 1998. Secondly, towards the end of June, there was an e-mail sent by AA to the airlines or their handling agents in which it was mentioned that the "FALLBACK FIDS" would be used at the trial. Although the airlines and their handling agents might not have known that the fallback FIDS, which was another term that could reasonably be used interchangeably with standby FIDS, would be tested at the trial, they should reasonably appreciate that that standby system was to be used. Thirdly, the evidence from the AA staff and

NAPCO personnel all pointed to the fact that the standby FIDS was in fact tested at the trial. The participation of the airlines and their handling agents at the trial which, albeit unbeknown to them, was also for carrying out a test of the standby FIDS, should not reasonably render W45 Chatterjee's report to ADSCOM of a successful test having been conducted on 30 June 1998 as false.

17.98 Admittedly, the report might have given a sense of security to members of ADSCOM who were relying heavily on the standby FIDS in the light of the history of instability of the main FIDS. However, insofar as there is insufficient evidence to qualify W45 Chatterjee's report as a misrepresentation, it would not be fair to condemn him on this score.

17.99 Rather, the lack of full knowledge on the part of the airlines and their handling agents that standby FIDS would be tested, as opposed to merely used, at the 30 June trial, indicates that AMD did not plan the test well and failed to co-ordinate adequately with the participants. The test required the participation of the airlines, but AMD failed to let them know that there was such a test. There was no meeting with the airlines or any details of the test and its procedure in writing for the airlines beforehand. This is another illustration of a failing in the AA management.

(f) The AA Board

17.100 The AA Board has overall responsbility for the problems on AOD because the duty for developing and operating the new airport, being part and parcel of the functions of AA and within the care and management of the affairs of AA, is placed squarely on it by section 4 of the Airport Authority Ordinance, which provides:

> "Subject to the provisions of this Ordinance, the affairs of the Authority shall be under the care and management of a board whose functions shall comprise such care and management."

17.101 The responsibility to discharge the functions of developing and operating the new airport remains with the AA Board, although it is allowed by sections 9 and 15 of the Ordinance to delegate its functions to a CEO and management.

17.102 The Commissioners do not accept counsel's submission that the AA Board should be responsible for W3 Townsend's acts and omissions or the acts and omissions of the AA management, nor that the Board should be professionally qualified.

17.103 W3 Townsend must be responsible for his own acts and omissions. He was appointed before the Airport Authority Ordinance came into force on 1 December 1995 when the present AA Board was constituted. The AA Board might or might not have realised W3 Townsend's deficiencies after the publication of the Booz-Allen & Hamilton report at the end of October 1997. Even if the Board felt that W3 Townsend might not be fully up to his job, it would be too risky to have him replaced at the time, bearing in mind that the new airport was to open within a matter of six months, the target then being April 1998. Replacing W3 Townsend required looking for a replacement and settling him in within a very short time without causing further disruption to management. Even if a replacement was immediately available, it is difficult to judge that the disruption to management at that juncture would not carry enormous risks for the preparation for opening the airport in a few months' time. All these matters are highly speculative, and the Commissioners cannot come to any reasonable conclusion that replacing W3 Townsend was a clear alternative open to the Board.

17.104 It is not disputed that the professional aspect of the work of AA could have been entrusted to a professionally qualified AA Board. The Board concerned consists of official members who are mainly high-ranking administrative officers of Government. The non-official members are mainly community leaders. There are a few professionals such as the Secretary for Works, but their professional fields did not cover IT. If full reliance were to be placed on the Board, it would need to be filled with

(a) professionals and experts in both construction and systems when the new airport was built; and

(b) professionals in business management and airport management for the operation of the new airport after it was built.

17.105 However, neither of the aforesaid is usual, and they do not normally occur in boards of directors of public companies where the interests of shareholders including members of the public are at stake. The rationale behind is apparent. A board such as the AA Board and boards of public companies are more normally constituted of people of prominence, respectability or capability than necessarily with professional or expert knowledge. Members of such boards are usually expected to decide on policies and provide overall steers, insight and perhaps foresight to the management instead of delving into operational details. If a board does not consist of such professionals and experts as are required for the job to be undertaken, as in the present case, it could and should have retained consultants to advise it on the project, especially its progress. In the case of the AA Board, however, that would involve expending public funds. As the AA management had already retained systems consultants such as CSE, any employment by the Board of another firm of consultants to oversee the progress of systems development would be duplicating efforts and resources, and would be questionable deployment of public funds. It is in these circumstances and from this perspective that the Commission agrees with W51 Yuen's view that it would be better for the AA Board to have consultants to advise it instead of the AA management employing experts to advise the management but not the Board. The benefit would be at least three-fold. On the one hand, the Board would have expert assistance in understanding the works on construction and systems and their progress, so that it would be able to discharge its functions imposed on it by the Ordinance, and satisfy itself as to the quality and progress of the works. In case anything untoward was reported by the consultants, the Board would be able to warn the management of it and instruct the management to take remedial or improvement measures. At the same time, the Board would have independent advice from the external consultants, instead of having no choice but to take the reports from the management on trust. The consultants' reports would be a source of information and advice additional to that provided by the management, operating as a check and balance that would be required for such an enormous project as the development of the new airport. As the consultants' advice would be made available to the Board and passed onto the management by the Board, the management could do away with retaining its own consultants on the same subject. Hence, there would not be duplication of efforts and expenses.

17.106 Apart from the eventual responsibility to bear in making the new airport ready on AOD, as it had assured ADSCOM, the AA Board should also be responsible for not having appointed outside consultants to advise itself, instead of allowing the AA management to have such consultants. However, this view may be derived from the wisdom of hindsight, which might not have been clear to the AA Board at the material time. The AA management consisted of various kinds of professionals, and it had the assistance from outside experts on systems development and progress. The AA Board might not have felt the benefit of having external consultants to advise it on the same subjects, which benefit would be more readily appreciated with hindsight. The Commissioners therefore consider that this failure of the AA Board should not be over-stated.

CHAPTER 18

CONCLUSIONS

Section 1 : The Decision to Open the Airport

18.1 The decision to open the airport on 6 July 1998 was taken by the Airport Development Steering Committee ("ADSCOM") in January 1998. The target date for the opening of the new airport was originally scheduled for April 1998. It was always understood that as a target date, it would require confirmation by a formal announcement nearer the time by Government in conjunction with the Airport Authority ("AA"), in the light of the overall airport readiness achieved and the prospect of the Airport Railway ("AR"), later known as Airport Express ("AE"), being ready ahead of time. AR had a completion date of 21 June 1998 but there was expectation that progress on AR could probably be accelerated to support airport opening in April 1998.

18.2 In AA's franchises with its franchisees, AA was obliged to give a three-month advance notice to the franchisees of the date of opening of the new airport. ADSCOM was mindful of the importance to fix an airport opening date well in advance so that the public as well as all concerned parties would know this date for their own purposes and planning. It was therefore necessary for Government to take a decision on a firm airport opening date at least three months ahead of April 1998.

18.3 AA's optimism that the airport would be ready for opening in April 1998 was not shared by ADSCOM for mainly two reasons: (a) in respect of the Passenger Terminal Building ("PTB"), the works programmes had slipped and the plan for systems training was tight; and (b) in respect of the Hong Kong Air Cargo Terminals Ltd ("HACTL"), there were delays in the construction works of SuperTerminal 1 ("ST1"). In October 1997, Mass Transit Railway Corporation ("MTRC") made a detailed presentation to ADSCOM explaining why it was not able to advance the completion of AR from June to April 1998. Given the doubts about the adequacy of the transport arrangements pending completion of AR and the state of readiness of airport systems and HACTL, ADSCOM decided in early January 1998 that airport opening should be deferred, with the aim of producing on airport opening day ("AOD") a world class airport supported by efficient transport facilities. 1 July 1998 was decided to be the date for the airport ceremonial opening to allow more time for AR to get ready and for public relations reasons (since it coincides with the first anniversary of the Hong Kong Special Administrative Region). In addition, ADSCOM accepted Monday, 6 July 1998 to be the date for the operational opening of the airport because a few days would be needed between the airport ceremonial and operational opening for the critical phase of the airport relocation exercise. Opening the new airport on a Monday would offer the advantage of the night move taking place when road traffic was light and when a big spectator turnout would be unlikely. Air traffic was also lighter on a Monday.

18.4 The Chief Secretary then explained to the Chief Executive in Council why ADSCOM had decided to defer the opening date to July 1998. He endorsed the decision and agreed that the Executive Council

("ExCo") should be informed of ADSCOM's recommendation. The 1 July date was eventually altered to 2 July 1998 for the ceremonial opening, obviously in order to prevent a clash of the airport opening ceremony with the activities anticipated for commemoration of the first anniversary of Hong Kong's reunification with the Mainland, while the day for the operational opening was unaltered to be on 6 July 1998.

18.5 The Commissioners find that ADSCOM acted cautiously and wisely in deciding 6 July 1998 as the operational opening day for the new airport. ADSCOM had considered all relevant matters very carefully and diligently after being provided with the necessary information by its executive arm, the New Airport Projects Co-ordination Office ("NAPCO"), and AA. NAPCO was acting as an overall monitor over AOR. AA furnished reports and information on the progress of the development of the new airport to NAPCO. NAPCO critically examined such material and advised ADSCOM accordingly.

18.6 Having examined all the evidence very carefully, the Commissioners find it clear that the Chief Executive in Council was not involved in any way in the decision making of the opening of the airport, although he approved that decision. The decision was taken by ADSCOM which was then reported to him by the Chief Secretary and also reported to the ExCo at its meeting on 13 January 1998.

18.7 In deciding on the operational readiness of the new airport, the policy consistently adhered to by ADSCOM was to have the new airport operating safely, securely, efficiently and smoothly. The Commissioners find that ADSCOM did not make any mistake in deciding that 6 July 1998 should be the date for the operational opening of the new airport. Indeed, ADSCOM members had exercised great care and diligence in reaching that decision. The main reason for ADSCOM's selecting July 1998 was to await the completion of AR, and that was despite AA's insistence that all critical AOR items would be ready by late April 1998. The added time of over two months between April and July would moreover provide a comfortable float to PTB and HACTL projects. The Commissioners conclude that it was a proper and wise decision. There was no evidence whatsoever to suggest that the decision to open the airport in July 1998 was a result of any political consideration or ulterior motive. During the period between January 1998 after the decision was made up till AOD, ADSCOM exerted no less effort and care regarding the progress of AOR issues. Numerous reports were required to be supplied by AA, numerous reports were made by NAPCO and many meetings were held by ADSCOM when very often AA's top management was invited to attend to explain various matters. The continuous assurance given by AA and HACTL that PTB and ST1 respectively would be ready had lulled ADSCOM members into a false sense of confidence and security, resulting in their not revisiting the opening date. Indeed, once decided, AOD should not be changed lightly, for it was a decision creating the certainty on which many people relied. Nonetheless, if sufficiently weighty material was proffered, the Commission has no doubt that ADSCOM would certainly consider whether a deferment was necessary. No one ever suggested a deferment or put situations before ADSCOM that would, at the time, justify a revisit of the decision. All concerned were taken by surprise by the chaotic situations that occurred on AOD. The Commissioners hence feel that it would be unreasonable to hold ADSCOM or any of its members responsible for not appreciating the risks of keeping AOD in the then prevailing circumstances.

Section 2 : Extent of Readiness and the Problems

18.8 When AOD was considered and eventually decided, there had been delays in the construction works and systems works relating to PTB. The construction works on HACTL's ST1 also suffered slippages. The additional time between the original target opening in April 1998 and 6 July 1998 was a cushion to ensure both PTB and ST1 would be ready. When eventually occupation permit was issued for PTB on 29 June 1998, temporary occupation permit ("TOP") was obtained by ST1 on 3 July 1998, and aerodrome licence was issued for the new airport on 1 July 1998, everything seemed to be ready that would provide Hong Kong with a safe, secure, efficient and smooth airport. No evidence has been received by the Commission that raises concern about the safety and security of the new airport on AOD.

18.9 The problems occurred on AOD related to efficiency. Two of the critical AOR issues on which everybody concerned focussed were the readiness of the Flight Information Display System ("FIDS") and ST1. FIDS was considered to be critical for the operation of the new airport, for the flight-related information to be provided by it was essential for airport operations. ST1's readiness was important because HACTL would be required to handle about 80% of all of Hong Kong's air cargo at the new airport. The deficiency of FIDS and the paralysis of ST1 were the major problems encountered on AOD that rendered movements of air passengers and air cargo inefficient.

18.10 There were also many other problems on AOD, mostly consequential upon the deficiency of FIDS which failed to provide prompt and correct flight-related information to various operators of the new airport. There were the baggage handling problems, where handling operators ("RHOs") were unable to have stand allocation information and flight times readily available through FIDS. These baggage problems delayed baggage reclaim by passengers and flight departures. Other problems that resulted from the deficiency of FIDS included late arrival of tarmac buses, insufficient ramp handling services, aircraft parking confusion, delay in flight arrival and departure, etc, which were most noticeable by the users of the airport.

18.11 Problems that were not caused by the deficiency of FIDS also occurred. They either arose individually, or they were a consequence of other problems. The Commission has classified all the problems that occurred since AOD into three categories: teething or minor, moderate and major. The categorisation was made in accordance with the opinion of experts appointed by the Commission and the Commissioners' own views as to the seriousness or otherwise of the nature of each problem. They are set out below:

Teething or Minor Problems:

[1] Mobile phone service not satisfactory
[2] Trunk Mobile Radio ("TMR") service not satisfactory
[3] Public telephones not working
[4] Escalators breaking down repeatedly
[5] Insufficient or ineffective signage

[6] Slippery and reflective floor
[7] Problems with cleanliness and refuse collection
[8] Automated People Mover (“APM”) stoppages
[9] Airport Express (“AE”) ticketing machine malfunctioning
[10] AE delays
[11] Late arrival of tarmac buses
[12] Aircraft parking confusion
[13] Insufficient ramp handling services
[14] Airbridges malfunctioning
[15] No tap water in toilet rooms and tenant areas
[16] No flushing water in toilets
[17] Urinal flushing problems
[18] Toilets too small
[19] Insufficient water, electricity and staff at restaurants
[20] Rats found in the new airport
[21] Emergency services failing to attend to a worker nearly falling into a manhole while working in PTB on 12 August 1998
[22] Traffic accident on 28 August 1998 involving a fire engine, resulting in five firemen being injured
[23] A maintenance worker of Hong Kong Aircraft Engineering Company Limited (“HAECO”) slipped on the stairs inside the cabin of a Cathay Pacific Airways Limited (“Cathay Pacific”) aircraft on 3 September 1998
[24] A power cut occurring on 8 September 1998, trapping passengers in lifts and on the APM as well as delaying two flights
[25] Missed approach by China Eastern Airlines flight MU503 on 1 October 1998

Moderate Problems:

[26] Delay in flight arrival and departure
[27] Malfunctioning of the Access Control System (“ACS”)
[28] Airside security risks
[29] Congestion of vehicular traffic and passenger traffic
[30] Insufficient air-conditioning in PTB
[31] Public Address System (“PA”) malfunctioning

[32] Insufficient staff canteens

[33] Radio frequency interference ("RFI") on air traffic control frequency

[34] Aircraft Parking Aid ("APA") malfunctioning: a Cathay Pacific aircraft was damaged when hitting a passenger jetway during parking on 15 July 1998

[35] An arriving passenger suffering from heart attack not being sent to hospital expeditiously on 11 August 1998

[36] Fire engines driving on the tarmac crossed the path of an arriving aircraft on 25 August 1998

[37] A Hong Kong Airport Services Ltd. ("HAS") tractor crashed into a light goods vehicle, injuring five persons on 6 September 1998

[38] Tyre burst of United Arab Emirates cargo flight EK9881 and runway closures on 12 October 1998

[39] Power outage of ST1 due to the collapse of ceiling suspended bus-bars on 15 October 1998

Major Problems:

[40] FIDS malfunctioning

[41] Cargo Handling System ("CHS") malfunctioning

[42] Baggage handling chaos

18.12 About 30 of the 42 listed problems occurred on AOD. Although the three major problems caused the greatest adverse effect on the operating of the new airport on AOD and for a period thereafter, all the other 27 problems occurred on AOD. Relating to airport operational efficiency, each of most of these 27 problems would not have raised concern or even been noticeable by itself . It was the concatenation of all these problems that created the chaos on AOD. In anyone's standard, the new airport was not ready to open on AOD.

Section 3 : Causes of the Problems and Responsibility

18.13 The Commission is tasked to find out the causes for the problems with the new airport since AOD and where the responsibility lies. In such an attempt, the Commission wrote numerous inquiry letters to persons or parties who might be concerned with each of the problems, and held an inquiry to hear preliminary matters, evidence and submissions by parties for 61 days. Within the time allowed by its terms of reference, the Commission is only able to find out the causes of and responsibility for most of the problems, but not all. A summary of the causes and responsibilities are set out in the following paragraphs.

Teething or Minor Problems

[1] Mobile Phone Service Not Satisfactory

[2] TMR Service Not Satisfactory

[3] Public Telephones Not Working

18.14 On AOD, only about one third of the public telephones planned for airport opening were operational at PTB and the other two systems of communication experienced different degrees of capacity overloading problems. TMR users also encountered reception and coverage problems at various places in the new airport. Both the malfunctioning of FIDS and the presence of a large number of curiosity visitors and stranded passengers during the first few days after airport opening are identified as factors contributing to unforeseen huge demand on the use of the three communication systems around that time.

18.15 The Commissioners consider that, as the concatenation of the many problems occurring on AOD that might increase the demand for mobile phone service was not properly foreseeable, it would not be fair to hold any of the operators responsible for the capacity overloading problems. On the other hand, AA should, however, be responsible for not giving advance warning to the operators of the possibility of heavy demand on the use of mobile phones in the event of FIDS failure.

18.16 As regards the use of TMR, the Commissioners hold the view that Hutchison Telecommunications (Hong Kong) Ltd (“Hutchison”) being one of the TMR operators should have foreseen the problem of weak signal transmitted from its base station located at Tung Chung and, therefore, put in place adequate counter measures to overcome the problem prior to AOD. Moreover, Hutchison should be held accountable for its failure to provide an operational link between its base station and the TMR Distributed Antenna Network for PTB. As for AA, the Commissioners find that it is the sole party responsible for the delay in completing the outdoor antenna farm for use by TMR operators. The delay inevitably had an impact on the operational efficiency of the TMR system for use on AOD. Also, since the use of TMR was part of the contingency or workaround measures for FIDS, AA should have forewarned the TMR operators as well as other airport operators of the possible heavy demand for service in the event of FIDS failure.

18.17 As to the subject of public telephones, both AA and International Computers Limited ("ICL") accepted that there was delay in the completion of the cabling and jumpering work which resulted in more than 60% of the planned telephones being not ready for service on AOD. However, without hearing all the witnesses from AA and ICL on the issue, it would not be possible for the Commissioners to attribute responsibility between AA and ICL. In any case, AA should be held responsible for failing its duty in coordinating and overseeing the cabling work and ensuring that prompt remedial action was taken when the delay and the effect of which was reasonably foreseen. As a matter of fact, AA did accept the responsibility for the cabling and jumpering problems encountered by New World Telephone Limited ("NWT") as the contractor for the supply and installation of the public telephones at PTB. For those telephones that worked on AOD, there were other operational problems, such as coin acceptance difficulties and, for these problems, NWT did not deny responsibility. The Commissioners note that, by mid July 1998, almost all public telephones were in operation.

18.18 In any event, the problems that plagued the three communication systems were short-lived and were rectified very quickly after AOD.

[4] <u>Escalators Breaking Down Repeatedly</u>

18.19 On AOD, in respect of the 59 escalators in operation, there were 20 incidents of stoppage on that day and 19 such incidents on the following day. While there are several contributing factors, the stoppages were mainly caused by the protective devices of escalators being set at too sensitive level, with the result that even slightly heavier loads would trigger a stop. This problem was remedied promptly after AOD by adjusting the safety devices to the appropriate levels so as to match the actual working conditions and passenger load. As a result of the adjustment, the stoppage rate dropped to around 0.2 per escalator each month which is considered to be normal. There were also incidents in which stoppages were caused by foreign objects jamming the steps or people pushing the emergency stop button for unknown reasons. These are, however, normal occurrences at airports or in public buildings.

18.20 Constructions Industrielles De La Mediterranee SA ("CNIM") is responsible for the first year maintenance of escalators and AA is responsible for their operation. Although the actual live load requirements of the escalators could not have been precisely foreseen, the Commissioners consider that, had sufficient tests been carried out before AOD, the sensitivity level of the protective devices could have been set properly. For this, both AA and CNIM should be responsible. The Commissioners further note that the unavailability of the automatic control and monitoring systems for maintenance services prevented staff of AA from responding quickly to breakdown of escalators. These systems were considered to be non-AOR critical and were not completed before AOD, apparently because of a lack of time. In any case, this seems to be a teething problem which was cured very easily and quickly after AOD. Operation of escalators in fact stabilised since the first week of airport opening.

[5] <u>Insufficient or Ineffective Signage</u>

18.21 Insufficient and ineffective signage has been cited as one of the problems plaguing the new airport during its initial period of operation. AA acknowledged that among more than 1,500 directional signs within PTB, a sign with single arrow within the Meeters and Greeters Hall pointed in the wrong direction and that misdirected sign was corrected in one day. Also, on AOD, an unanticipated number of passengers and visitors used the external buses instead of Airbuses and crowded at Cheong Tat Road which led them to Level 3 (ground level).

As a result, passengers starting at Level 3 without luggage and visitors were diverted to the Departures Hall through the Arrivals Hall. This caused some confusion under the one-way flow signage system as these passengers presumably saw signs intended for arriving passengers rather than for departing passengers. Having reviewed the evidence, the Commissioners agree that members of the public visiting PTB for the first time will necessarily go through a period of familiarisation with the new environment. Complaints about inadequate signage do not seem to be borne out by factual evidence. In the light of evidence, conflict of allegations between the Board of Airline Representatives and AA cannot be resolved. In any case, airport operation readiness does not reasonably include signs for airline offices. Even if there was a problem, it was but a teething problem that was quickly remedied by means of the additional signs installed in July and August 1998. The Commissioners accept the expert advice of W51 Mr Jason G YUEN, an expert appointed by the Commission, that signage additions, revisions and refinement is quite common among major airports after the terminal has been put to actual use. In this regard, the Commissioners do not intend to attach any blame to any party.

[6] Slippery and Reflective Floor

18.22 There were criticisms about the black granite floors which were allegedly both slippery and very reflective causing potential embarrassment to female airport users wearing skirts. According to evidence, a total of five incidents of people slipping on floors in the public areas of PTB were recorded between AOD and 31 August 1998. However, it is noted that none of the incidents occurred on the black granite floors and, also, wet floor was a contributing cause in two of the incidents.

18.23 The problem of slippery and reflective floors came up during the first airport trial held on 18 January 1998. As a result of feedback from the trial participants, AA carried out remedial actions to raise the slip resistance of the polished surfaces by means of honing. The task however proved to be extremely time consuming. After research, AA decided to carry out non-slip surface treatment to all black granite surfaces but the whole operation could not be completed before AOD.

All treated floor surfaces meet the standard of the American Society of Testing and Materials for use by disabled persons.

18.24 Having reviewed the history leading to the problem, the Commissioners do not consider that it is part of the usual teething difficulties since it is something that was identified and anticipated at an early stage. AA should be blamed for its failure to take prompt and speedy remedial action to eradicate the problem prior to AOD. The overall problem is only very minor in nature as the rate of incidents of people slipping on floors does not appear to be out of the ordinary in view of the approximately six million people using PTB during the same period. However, should AA have tackled the matter more promptly, the problem would not have been allowed to develop into an issue on airport opening.

[7] Problems with Cleanliness and Refuse Collection

18.25 There were problems of cleanliness and refuse build-up in some parts of PTB immediately before AOD and shortly thereafter. While there were various causes for the problem, it was evident that both AA and its various cleaning contractors tried their best endeavors to overcome the problem. Unfortunately, because of the enormous amount of waste, from both PTB tenants and the large number of sightseers and stranded air passengers, AA and their cleaning contractors were simply unable to cope with the required work within a short time.

18.26 From the evidence available, the following factors are possible causes contributing to the problem:

(a) PTB tenants were late in taking up their premises and, hence, completing their fitting-out works. As a result, their relocation exercises started later than anticipated and this eventually led to large volumes of construction refuse to be removed within a short time. What made the situation even worse was that some tenants failed to comply with the proper disposal procedures and dumped their rubbish in the surrounding premises.

(b) There were a number of design or equipment related deficiencies impacting on the operational efficiency of the disposal system. For instance, the design of the refuse room is inadequate to cope with the demand in some areas. Also, refuse chutes between Level 5 and Level 3 are not continuous, thus requiring waste to be pushed along a walkway on Level 4. Another problem is that some refuse rooms and refuse compactor stations were not ready for use on AOD.

(c) Much longer time was needed by Aviation Security Company Limited ("AVSECO") to issue security permits for both workers and vehicles of cleaning contractors and this severely affected the latter's ability to deploy adequate resources to work within the restricted areas.

(d) The coordination between AA and its cleaning contractors was insufficient resulting in the failure to provide adequate cleaning service. In one incident, one of the contractors, Lo's Airport Cleaning Services Limited ("Lo's"), failed to undertake an order instructed by AA due to difficulties in communication. There was also an allegation from AA claiming that the contractors stuck rigidly to their respective boundaries of work.

(e) The presence of a large number of curiosity visitors and stranded passengers at the new airport shortly after AOD undoubtedly aggravated the problem of rubbish build-up.

18.27 The problem lasted only a few days after AOD. By 10 July 1998, all rubbish was substantially cleared and there is now sufficient manpower inside the restricted areas to carry out cleaning services. On the issue of responsibility, the Commissioners find reasons to believe that both the PTB tenants and AA as the management authority should be held responsible for not ensuring timely completion of fitting-out works and proper removal of the fit-out debris. As to the design deficiency, AA together with The Mott Consortium ("Mott") as the design contractor may both be accountable for the resulting difficulties. The Commission does not have sufficient evidence to apportion responsibility in relation to the late availability of security permits for the cleaning workers and vehicles. While the Commissioners are not prepared to lay any blame on the cleaning contractors in view of their efforts made in tackling the problem, AA should be criticised for the overall failure in the provision of adequate cleaning service.

[8] APM Stoppages

18.28 There were stoppage problems with the operation of APM during its initial period of operation. While most of the incidents were related to door-related problems, passengers were trapped inside an APM train and unable to leave for about 50 minutes in the incident that occurred on 20 July 1998.

18.29 The investigation conducted by Mitsubishi Heavy Industries, Ltd. ("MHI"), the operation and maintenance contractor for APM, revealed that most stoppages were caused by vehicle door failure, platform door failure or train overshooting. There were incidents in which passengers forced a door open and this effectively disrupted the closing movement of train doors, causing the train in question to stop. The friction of door equipment with surrounding mechanical parts and the failure of local door control circuit were also identified as the causes leading to train stoppages. A number of remedial measures had been taken to tackle the problems. Measures will continue to be undertaken to maximise the vehicle stopping accuracy. Following the series of incidents, AA also took steps to provide station attendants at each of the four APM platforms to assist in passenger control.

18.30 In the incident on 20 July 1998, one passenger accompanied by four airline staff members were trapped inside a train and were unable to leave until 50 minutes later. Before the APM maintenance staff arrived to restore the train, the group of passengers attempted to pry open the door by turning the emergency door release valve and eventually got onto the emergency walkway. For safety reasons, the APM operator immediately shut down the traction power in the tunnel and the five persons were eventually escorted to the West Hall departures station.

18.31 The above problems identified with the APM system resulted in only slight disruption of train service and, consequently, some degree of passenger inconvenience. For most of the occasional stoppage incidents and, in particular, the trapping incident on 20 July 1998, passengers should primarily be blamed for their improper behavior in forcing themselves through closing doors or attempting to pry open doors. While the door-related failures may be regarded as part of the start-up difficulties that will disappear after fine tuning, the Commissioners hold the view that, should more thorough and proper modification works have been done by the contractor prior to commissioning of the system, the frequency of occurrences could have been minimised. Also, the Commissioners consider that AA should be responsible for its failure to ascertain correctly the actual operational needs and to put in place from AOD sufficient attendants to attend to train problems and for keeping of the order of passengers at the platforms. Furthermore, the Commissioners are concerned with the apparent lack of an effective communication means between Airport Operations Control Centre ("AOCC") and the APM maintenance staff while attending to emergencies. As revealed by the incident on 20 July 1998, the maintenance staff did not have access to the use of the TMR system of AA. It was possible that the rescue action in the incident could have been much quicker if the maintenance personnel were provided with radios for communication with AOCC.

[9] Airport Express ("AE") Ticketing Machine Malfunctioning

[10] AE Delays

18.32 When AE went into operation on AOD, the coin management system on all ticketing machines was not in service due to some software problems and, as a result, they would accept notes only. The problem had in fact been identified in loading tests carried out prior to AOD and, to cope with actual needs upon commissioning of AE, MTRC put in place a series of counter-measures to facilitate passengers. The problem did not last long and, by 14 July 1998, the software problem was completely solved and all ticketing machines have been working properly since 24 July 1998.

18.33 As to the issue of disruption of service, MTRC decided prior to AOD that AE should open for passenger operations on 6 July 1998 at a service interval less than the design capacity for full operation and with the journey time longer than the scheduled time of 23 minutes. This was because of the highly complex nature of integration of the many systems involved and the need to regulate both the Tung Chung Line service and the AE service that operated on the same pair of tracks for the most part of the length of the railway. As a result, the AE service would be run at 12-minute intervals when it went into operation. According to records available, there were minor train service disruptions on 9, 11, 14, 23 and 27 July 1998 and in some incidents passengers were transferred from one train to another, the most serious incident was that on 23 July 1998.

18.34 The Commissioners accept that the problem relating to ticketing machines is only minor, particularly in the light of the effective counter-measures put in place by MTRC from AOD. Nonetheless, the fact remains that there were coin handling problems with the machines and, for this, MTRC is responsible for its failure to ensure that problem free machines were available for use on commissioning of AE. As regards service disruptions, MTRC is also responsible although it is accepted that these were start-up problems and have not recurred since the end of July 1998. Since October 1998, AE has operated at the original performance specification of 8-minute service intervals with a journey time of 23 minutes.

[11] <u>Late Arrival of Tarmac Buses</u>

18.35 HAS is the sole franchisee for the provision of airside bus service, commonly known as tarmac buses, for the transportation of passengers and airside staff between PTB and remote stands. On AOD and the following day, there was significant delay in the disembarkation of arriving passengers, both at the frontal stands of PTB and at remote stands. In some incidents, the delay lasted up to two hours.

18.36 It has been revealed that while the delay at the frontal stands of PTB docking bays were primarily caused by problems pertaining to airbridges, the delay in the disembarkation of arriving passengers at the remote stands was due to a combination of factors. In essence, the breakdown of FIDS and the overloading problems of TMR and mobile phone networks were all contributing causes impacting on the efficiency of the operation of tarmac buses. Also, there was a greater utilisation of remote stands for parking of aircraft due to serious flight delays and this put more pressure on the demand for tarmac buses. Furthermore, flight delays and a full apron on occasions created difficulties in coordination between boarding gate assignment and the location of aircraft. This in turn resulted in increased travelling time due to the longer distance between PTB and some remote stands. Another relevant contributing factor is that, due to the insufficient number of security cards made available by AA, arriving passengers and airline staff could not gain admittance to PTB on some occasions resulting in busdrivers having to act as doormen. Since AOD, a number of remedial measures had been taken to improve the operational efficiency of the tarmac bus service and, by 13 August 1998, bussing operation was able to achieve service standards in over 90% of the assignments.

18.37 In the light of evidence, the Commissioners accept that the main cause for the inefficient and late tarmac bus service was the deficiency of FIDS resulting in the lack of accurate and prompt flight information to HAS. The problems with airbridges, TMR and mobile phone systems compounded the difficulties and, as a result, HAS' manpower was strained for locating arriving aircraft. AA as the terminal management must be responsible for all these factors in causation. On the other hand, the Commissioners find that there was only one bus available in reserve, instead of three as agreed between AA and HAS. Without going into the contractual liability between the two parties concerning planning of resources, it is clear that had two more buses been made available as reserve on the first two days, the added 10% of resources would have helped alleviate the situation. In this regard, the responsibility must be attributed to HAS.

[12] Aircraft Parking Confusion

18.38 On 6 and 7 July 1998, aircraft stand allocation had to be performed by staff of the Apron Control Centre ("ACC") manually due to the problems with SAS and TMS. Problems of FIDS and TMS around that time also hampered the ability of ACC to perform timely allocation of parking locations for departing and arriving flights. Furthermore, extended stay of aircraft due to flight delays eroded parking capacity and made the allocation task more difficult. The problem was compounded by other airport problems such as the malfunctioning of some airbridges, failure of some ACS doors, communication difficulties encountered by operational staff, insufficient towing tractors due to the amount of aircraft repositioning required, non-familiarity of push-back procedures by some tractor drivers, and the unfamiliarity of pilots with the apron, taxiways and remote stands.

18.39 The Commissioners find that aircraft parking confusion is basically a consequential problem resulting directly from problems relating to FIDS and the operation of ACC. With FIDS, together with stand allocation, now back in proper operation, and as a result of the improvement measures to passenger, baggage and ramp handling services, significant improvements have been achieved in terms of aircraft parking.

[13] Insufficient Ramp Handling Services

18.40 The cause of the delay in providing mobile steps for passengers at the remote stands was similar to that in the provision of tarmac bus service described in item [11] above, although all the three RHOs, instead of HAS alone, were involved in serving passengers. With the exception of too few tarmac buses, which relates solely to the issue of late arrival of tarmac buses, the conclusions of the Commission as to the causative problems including the deficiency of FIDS, and responsibility are identical as those relating to tarmac buses. Following improvements in the performance of FIDS and TMR and in the operation of airbridges, ramp passenger services have greatly improved. As to the servicing of passengers disembarking through airbridges, the relevant problems and causes are summarised under item [14] below.

[14] Airbridges Malfunctioning

18.41 On AOD, four of 74 airbridges were out of service for one to two and a half hours. From AOD to Day Five, there were 19, 30, 30, 30 and 34 faults calls respectively and, up to the end of July, there were in total 576 fault calls. Many of the faults related to auto-leveller failure alarms and there were also problems in the extension and retraction of the airbridges to and from the aircraft. To deal with the problems, two airbridge teams were formed on Day Three by AA and PT. Bukaka Teknik Utama-RAMP Joint Venture ("Bukaka Ramp") to restore service promptly and, usually, service was restored in no more than five minutes. The unusually high number of auto-leveller failure alarms was caused by a programming error in the software for controlling airbridges. The error was identified on 11 July 1998 and solved on the following day. Refresher training was also provided to RHO staff and, since then, the problem with airbridges has not recurred.

18.42 The Commissioners find that Bukaka Ramp as the installation contractor should be responsible for the programming error that caused the auto-leveller alarms. Also, had there been more varied or extensive testing or trials of the equipment, the problem might have been detected and rectified prior to AOD. For this, Bukaka Ramp and AA or one of them should be responsible. On the other hand, the Commissioners do not accept that the problems experienced with the airbridges could be attributed to operators' errors since all the operators had been certified by AA before they were allowed to operate the equipment single-handedly. In this regard, no blame should be attached to the operators.

[15] <u>No Tap Water in Toilet Rooms and Tenant Areas</u>

[16] <u>No Flushing Water in Toilets</u>

18.43 The AEH Joint Venture ("AEH") is the contractor employed by AA in respect of the installation of the systems which provide flushing and potable water to toilets in the public areas and valved connections to the boundary of the tenant areas in PTB. The supply, installation, testing and commissioning of the related electrical and hydraulic works were carried out by its subcontractor, Rotary (International) Limited ("Rotary").

18.44 On AOD and the few days thereafter, there were problems with the supply of flushing and tap water in certain areas of PTB. The primary causes of the problem were basically related to difficulties with the functioning of Tank Rooms 2, 3 and 8. In the morning of 7 July 1998, flooding occurred in Tank Room 2 and caused the control panel that operated the pumps to be switched off. This resulted in the suspension of water supply from the tank room. Staff of both AEH and Rotary attended to the problem and deployed temporary pumps to pump dry the area. Water pumping from Tank Room 2 was resumed at about 7:45 am on 8 July 1998. The flooding was later found to have been caused by blockage in the pipe work for which Nishimatsu Construction Co., Ltd. ("Nishimatsu") was responsible. On 18 July 1998, a section of the pipe was found to have been broken. Remedial work was subsequently carried out and the pipe was reinstated on 15 August 1998.

18.45 As to the Tank Rooms 3 and 8, it was known immediately prior to AOD that the valves which regulated water flow into the water tanks were not functioning properly. To ensure an adequate level of water, they had to be manually operated by Rotary on a 24-hour basis. However, staff of Rotary were denied access to the tank rooms on AOD. As a result, no one was there to operate the tank rooms and the water in the tanks ran dry. Water supply was not restored until the morning of 7 July 1998 when Rotary's staff were allowed access to the tank rooms. The tank rooms were under manual operation as late as mid-September and there has not been any further interruption of water supply.

18.46 The Commissioners note from evidence that there was contradictory evidence regarding the causes of difficulty of Rotary's staff in gaining access to the tank rooms. Irrespective of who should be responsible for the causes, it appears that there was a lack of coordination between AA, AEH and Rotary to ensure that Rotary would be allowed access on AOD. For this, Airport Management Division ("AMD") of AA should be responsible as the manager for the new airport. As to the flooding incident, there was evidence to show that the problem of flooding was foreseeable since there had been flooding of tank rooms since late May 1998. AA did admit that they foresaw the flooding problem and had instructed the British-Chinese-Japanese Joint Venture ("BCJ"), being the main contractor responsible for construction of pipes underneath the tank rooms, to remove any blockages in the pipe to Tank Room 2. AA, however, did not ask Nishimatsu to deal with the problem of flooding and, despite the steps taken, further flooding continued to occur in the later part of June and on 5 July 1998. Even so, AA did not arrange with Rotary to install a pump to prevent further flooding or take other preventive measures before AOD. In this regard, the Commissioners conclude that there was a lack of coordination amongst AA, BCJ, AEH, Nishimatsu and Rotary, for which AA as manager of the new airport should be primarily responsible.

[17] <u>Urinal Flushing Problems</u>

18.47 From the evidence available, there are four problems identified with the urinals in the new airport, namely (a) difficulties in controlling the flushing water flow; (b) maladjustment of the infrared sensors which activate the flushing valves; (c) blockage of urinals caused by rubbish; and (d) cleanliness of toilets. The conclusions of the Commission in relation to the causes of and responsibility for the problems are summarised below:

(a) The desired flow rate of flushing water through the flushing valves should be sufficiently high to self clean the valve of seawater sediment whilst at the same time not causing splashing. However, the poor quality of seawater and a low flow rate caused the build-up of sediment in the flushing valves of urinals. This problem was identified in early 1998 but it was only until mid-July 1998 when AA eventually accepted the recommendation of the subcontractor, Rotary, to install hoods and an amended piston within the valves. The Commissioners consider that AEH being the contractor should be responsible for failing to provide a satisfactory flushing system for the urinals and to install weirs to stop sand and dirt from getting into the water pipes. AA should bear some responsibility in not taking prompt and sufficient remedial actions to prevent or alleviate the flushing problem. The Commissioners also accept W54 Professor Xiren CAO's expert view that there were some design problems, for which AA may be held responsible.

(b) Not all the infrared sensors had been correctly set to detect a person standing at normal usage distance from urinals. Also, some users mistakenly pressed the sensor cover plates, believing this to be a flushing button and this either damaged the sensors or affected their setting. To avoid the misconception, a label reading "Do Not Push" was affixed to each sensor cover plate. Replacement of the damaged sensors was effected by the end of August 1998 and they were fitted with more substantial fixtures to prevent interference and damage. There is conflicting evidence as to which party is responsible for the correct setting of the sensors, and no firm conclusion can be reached. As to the damage to sensors, the Commissioners note the view of W51 Yuen that public misuse is a normal occurrence in a busy airport, and consider that, in view of the large number of visitors in the early days of airport opening, no one should be blamed for the problem.

(c) Blockages in drains were caused by users disposing of rubbish into urinals and the problem was exacerbated by the huge number of visitors present at the airport. It was alleged that the plastic waste strainers in urinals were not fixed and this allowed rubbish to get into the system thereby causing blockages. The Commissioners note in this context that regular attendance by cleaners was required to clear rubbish in the urinals and therefore prevent blockages in urinals. Lo's as the cleaning contractor is responsible for keeping the toilets clean.

(d) While a number of matters such as staff training and supervision issues, the flushing problems, lack of both flushing and potable water and urinal blockages were cited as contributing causes, the problem of cleanliness might well be attributed to the sheer number of curiosity visitors and stranded passengers during those days. In any event, the Commissioners are of the view that the toilets were not sufficiently clean simply because of the shortage of manpower but are unable to decide on the responsibility in the light of the evidence received . The shortage of manpower might have been caused by the difficulties encountered by Lo's in obtaining permits from AVSECO for its staff to enter restricted areas but the evidence received does not allow the Commissioners to reach a fair conclusion as to the responsibility. However, this matter relates principally to coordination and operation amongst contractors working within PTB and AA as their employer and manager of the new airport should primarily be responsible.

18.48 All the necessary rectification work by contractors were completed by mid-October 1998 and, since then, substantial improvement has been achieved since then.

[18] <u>Toilets Too Small</u>

18.49 There were criticisms about the size of the toilets in PTB which was allegedly too small causing inconvenience to airport users. In particular, air passengers could not get their baggage trolleys into toilets. The Commissioners find that the design of toilets at the new airport was based on the planning guidelines of the British Airport Authority ("BAA") and that the actual provisions exceeded the BAA requirements for some facilities. Given the sheer size of PTB, AA adopted an approach that was different to that in Kai Tak to provide strategically a large number of smaller toilets, so as to enable passengers to locate them easily. As to the accessibility of trolleys, it was a deliberate decision of AA not to allow trolleys into toilets having regard to the travelling habits of passengers. Even so, suitable circulation space around the hand basins and urinal stalls was available to accommodate a trolley if it was brought into the toilet.

18.50 It is also noted that AA has taken on board the comments received from the various airport trials and made efforts to modify and improve the design of toilets. The efforts resulted in provision of additional lighting, installation of hand dryers and widening of the dry shelves. In particular, the height of the cubicle doors which originally stretched from floor to ceiling was reduced, so as to alleviate the claustrophobic feeling on the part of users. New larger toilets were also constructed in the meeters and greeters area for the convenience of airport users.

18.51 The Commissioners accept the rationale behind the design of toilets for the new airport. The Commissioners also accept the view of W51 Yuen that AA's policy of not allowing baggage trolleys into toilet rooms is common amongst many airports. However, it is the view of the Commissioners that toilets and their passageways could perhaps be widened slightly to convenience airport users. While there has been a suggestion that the consideration of commercial rental revenue might have affected the provisions for toilets, the Commissioners do not find any hard evidence to conclude that AA has inappropriately trimmed down the facilities in order to maximise the commercial rental space in PTB. Although it is true that the existing provisions meet the BAA standards, it remains a fact that public expectations have not been fully met in terms of the size and more generous allowances for space in toilets could have been provided.

[19] <u>Insufficient Water, Electricity and Staff at Restaurants</u>

18.52 There were complaints about the service of restaurants at the new airport. This is attributed partly to problems with water and electricity supply to restaurants in the first few days after AOD and partly to some staffing difficulties experienced by some operators.

18.53 According to AA, the problems relating to inadequate utilities were caused by tenants who took possession of their premises at the last possible moments and, hence, were late in their submission of applications for connection of water and power supply. Also, some tenants failed to carry out their work according to the required standards, causing delay in water supply. There were a number of occasions of power outage which, as alleged by AA, were mainly caused by faults in the electrical installation put up by tenants. In an incident on 7 July 1998, the power failed for 2 hours and 40 minutes. The outage was caused by improper loading setting in the installation of a tenant but the maintenance staff of both AA and the contractor was refused access by AVSECO to the switch room to carry out remedial work. In a separate incident on 17 July 1998, the outage lasted for about four hours and AA suspected the cause to be related to a contractor staff of Cathay Pacific working on the CX lounge who left a fire hose reel running resulting in a short circuit across the terminal. AA also revealed that the actual demand for electricity from tenants was out of its expectation and, as a result, the overall power system had to be upgraded. On the other hand, tenants complained that they had difficulties in getting security permits promptly to enable their contractors to carry out work in restricted areas.

18.54 For restaurants in the restricted area, there were problems with their staff not receiving security passes by AOD and these prevented them from attending to duties. On the landside, the large number of visitors, in excess of 60,000 per day during the first week of airport opening, taxed the facilities beyond expectations. As a result, restaurants experienced problems of long queues, lack of food variety and inability to operate long service hours. To address the issue, AA reminded all catering licensees to comply with the service standards in the licence agreements and made improvement to the permit issuing process by introducing a new type of temporary permit from mid-July 1998.

18.55 The problems with restaurants was generally short-lived. After the first week following AOD, the problems have substantially subsided as the number of sightseers gradually decreases. The Commissioners consider that both AA and the relevant tenants had a part to play in the problems of utilities supply. Both parties have contributed to the problem relating to the upgrade of the power system but, without the benefit of time to investigate further into the matter, the Commissioners are unable to apportion responsibility in this respect. As to the power outage incident on 7 July 1998, the tenant concerned is probably responsible for causing the problem although it is not possible for the Commissioners to assign responsibility. Also, AA or AVSECO should be held responsible for the delay in effecting the remedial work of this electricity outage. For the incident on 17 July 1998, there is however no substantial evidence before the Commission to pinpoint clearly the culprit despite the allegation of AA. As to staffing, while the tenants are responsible for ensuring that their staff were sufficient and well trained so as to provide a reasonable level of service, the Commissioners are unable to determine who should be responsible for the late issuance of access permits to restaurant staff working on the airside because of the massive late-minute rush for permit and the regular breakdown of ACS and the permit system.

[20] Rats Found in the New Airport

18.56 It was reported in the media towards the end of August 1998 that thousands of rats were pestering the new airport. Allegedly, parts of PTB and the aircraft maintenance facilities were affected.

18.57 The Commissioners find from evidence that AA arranged for the employment of a full time professional pest control contractor to provide pest control service for the common areas of PTB and the ground transportation system in as early as October 1997. As a result, an intensive 120-day rodent eradication programme was implemented with effect from 1 May 1998. In addition, an in-house pest control team was employed to carry out rodent control work in various areas of the new airport and the work area covered the airfields, aprons and small airport ancillary buildings when the airport went into operation in July 1998. As to the airport tenants, they are required under their tenancy agreements to implement their own pest control programmes. Periodic environmental audits are also being performed in tenant areas to ensure the adequacy of these programmes.

18.58 In the light of the evidence, the Commissioners are satisfied that it is but a minor problem. Although it is not certain as to whether rats could be completely eradicated, the situation appears to be under control and will continue to be under control provided that AA keeps up its efforts in this regard.

[21] Emergency Services Failing to Attend to a Worker Nearly Falling into a Manhole while Working in PTB on 12 August 1998

18.59 On 12 August 1998, a worker nearly fell into a manhole in a cable tunnel L3 near Gate 61 in PTB and sustained minor injuries as a result. In the incident, it took 17 minutes for ambulance service to reach the scene and locate the injured. It was discovered after the arrival of the ambulance that special service operation crew was required to save the injured worker. Therefore, another call had to be made to the Fire Services Communication Centre ("FSCC") through AOCC and that call was only made 21 minutes after the first report.

18.60 The Commissioners are of the view that, on the first call, an ambulance as well as a fire engine with trap rescue equipment should have been despatched in view of the nature of the request for assistance. There was apparently a misunderstanding between the caller and the receiver of the call. However, the Commissioners are unable to ascertain who should be responsible for the delay of rescue on the basis of information available. This is, however, only a minor incident.

[22] Traffic Accident on 28 August 1998 Involving a Fire Engine, Resulting in Five Firemen Being Injured

18.61 On 28 August 1998, a Fire Service Vehicle lost control and hit the kerb embankment whilst travelling along the slip road of the Airport Road towards Tung Chung. Upon impact, the vehicle ran down a slope and five Fire Services Department ("FSD") personnel were injured in the accident.

18.62 While the investigation of the Police did not reveal sufficient evidence for further action to be taken, FSD concluded from its investigation that the accident would be attributed to the driver's misjudgement and FSD suspended the driver from driving duties. The driver was also held responsible for paying for the repair cost of the damaged vehicle. The Commissioners note that there has been thorough investigation by both the Police and FSD over this incident and agree with the findings of FSD.

[23] A Maintenance Worker of HAECO Slipped on the Stairs inside the Cabin of a Cathay Pacific Aircraft on 3 September 1998

18.63 A maintenance worker of HAECO fell from a flight of staircase inside the cabin of a Cathay Pacific aircraft while at work on 3 September 1998. The worker sustained minor injuries in the incident. The Commissioners consider that it is only an isolated accident for which no one should be held responsible.

[24] A Power Cut Occurring on 8 September 1998, Trapping Passengers in Lifts and on the APM as well as Delaying Two Flights

18.64 From the press reports, the Commissioners note that, on 8 September 1998, passengers and airport staff were trapped in lifts and APM trains for several minutes as a result of power failure. Two flights were also delayed in the incident. Investigation into the incident was made by Rotary but no conclusive evidence as to the cause has been made available so far. Investigation is still ongoing. In any event, this is only a minor incident.

[25] Missed Approach by China Eastern Airlines Flight MU503 on 1 October 1998

18.65 On 1 October 1998, a China Eastern Airlines flight MU503 was instructed to carry out "missed approach" when a Cathay Pacific Airbus was unable to vacate the runway in time for the landing of MU503. According to AA, missed approach procedures are safe and standard manoeuvres published in the Aeronautical Information Publication for pilots and, also, missed approaches are not infrequent occurrences in an airport. In the light of evidence, the Commissioners agree that the incident was handled safely, efficiently and in accordance with laid down procedures. No responsibility can be attached to anyone.

Moderate Problems

[26] Delay in Flight Arrival and Departure

18.66 There were significant delays of incoming and outgoing flights during the first week of operation of the new airport. On AOD, incoming flights and outgoing flights experienced an average delay of 24 minutes and 2.63 hours respectively. The delays became more serious after around 11 am when traffic was very busy. These delays were not however problems in themselves but, rather they were the results and consequences of other airport problems such as the inefficiency of FIDS, difficulties in baggage handling, airbridge malfunctioning, confusion over parking of planes, late arrival of tarmac buses, problems encountered by

RHOs and other operators in the use of TMR and mobile phones, and malfunctioning of PA and ACS. Another contributory factor on AOD was cargo handling chaos which caused delays in the processing of cargo. The combined effect of all these factors was that it took much longer than the usual turnaround time for an aircraft arriving at and departing from the new airport.

18.67 In the light of the evidence, the Commissioners accept that flight delay is only a consequential problem resulting from a combination of other problems. The cause of and the responsibility for them can be found under the respective items.

[27] Malfunctioning of ACS

18.68 ACS is a computerised system that performs 3 functions, namely, production of permits, verification of permits and monitoring movement of personnel through ACS doors.

18.69 Guardforce Limited ("Guardforce") was the contractor for ACS. Controlled Electronic Management Systems Limited ("CEM") was the nominated subcontractor of Guardforce, mainly to provide software works for ACS. The British-Chinese-Japanese Joint Venture ("BJC") was another contractor of AA to provide doors, electromagnetic locking and detection devices. The processing of permit applications were carried out by AVSECO.

18.70 ACS had not been completed on AOD, although AA claimed that it was operational. There had been significant slippage for site acceptance test ("SAT") which was supposed to be carried out in December 1997. As at 30 November 1998, SAT was only about 60% complete.

18.71 Since AOD, there were various reported problems with ACS. There were problems with the timely production of security permits. The lack of security permits affected staff and workers in carrying out their work. Some of the ACS doors including airbridge doors were not working. On AOD, 11 out of 38 airbridge doors were not working. There were reported incidents both on and shortly after AOD of passengers being trapped in the airbridges because of the malfunctioning of the ACS doors. This resulted in the deactivation of all the airbridge doors for departing flights from 7 July to 19 July 1998 and the security guards being posted to maintain security. The malfunctioning of ACS doors also had an impact on airline staff and other people working at the new airport.

18.72 Delay in permit production. The Commissioners find that the development and installation of ACS had been plagued by delays and various problems, which contributed to the delay in permit production. In particular, the Commissioners have come to the following conclusions:

(a) Guardforce should mainly be responsible for the delay caused by the instructions to include Chinese text in the permanent permits, although AA should have imposed the requirement of Chinese text in the contract or issued the instructions earlier.

(b) Guardforce should be responsible for the breakdown of the printing equipment, breakdown of the permit system caused by the failure of the server at Kai Tak and the lack of ink and paper for permit production.

(c) Guardforce should not be responsible for the two occasions of downtime in the Permit Production Office caused by power failures or power changeovers. There is insufficient evidence for the Commission to reach a finding whether AA should be responsible for these downtimes.

(d) The business partners of AA, and possibly AA, should be responsible for the large number of last minute rush applications for permits. There is no sufficient evidence to conclude that AA failed to make planning to avoid late applications or that such plan was not followed through by AA. Accordingly, AA should not be responsible.

18.73 On ACS doors and other problems relating to the disruption of the works under the ACS contract C396, a great number of allegations were raised by the parties concerned. After considering the evidence very carefully, the Commissioners make the following findings:

(a) On AA's instructions to set up a temporary system at Kai Tak for permit production, if Guardforce had felt that the instructions were outside its original scope of work, it could have either refused to accept the instructions or have warned AA of the risk of disruption. Guardforce failed to do either. If Guardforce accepted the instructions as it did, it must provide additional resources to complete the work without allowing it to cause disruption to the contract works.

(b) On AA's instructions to transfer the data from Kai Tak to Chek Lap Kok ("CLK"), Guardforce should be responsible for the disruption caused by these instructions, since the need to transfer data was already foreseen by Guardforce.

(c) The alleged late instructions for five further computer terminals should not reasonably be considered as a factor contributing to the ACS problems. The added computer terminals would presumably have helped quicker production of permits and should not have been treated as a problem, in particular, if Guardforce had sufficient resources to comply with the instructions.

(d) The Commissioners accept that physical damage to doors and wrongful activation of alarms caused disruption to the installation and testing of ACS. Those people who committed such irresponsible acts of vandalism should be responsible. There is evidence that AA did make a lot of efforts to prevent vandalism. It may be unreasonable therefore to find AA responsible.

(e) Guardforce should be responsible for its incorrectly installed apparatus.

(f) Guardforce should be responsible for the software problems of ACS.

(g) Guardforce should be responsible for the downloading problems.

(h) Guardforce and CEM probably had resources problems, and they should be responsible for having inadequate resources in performing contract C396.

(i) AA's allegedly late instructions would not have caused serious delays in the C396 contract works. Nevertheless, they must have caused some hindrance to Guardforce's work.

(j) The late application for permits by the business partners of AA did cause added difficulty to ACS.

(k) Guardforce was hampered by the delay in completing and repairing the mechanical parts of the doors of ACS. According to BCJ, the problems with the defective door holders were attributable to the design changes of AA. The fact that Guardforce was awarded extensions of time would indicate that it was affected by such delay.

(l) Guardforce was disrupted in its work by the damage to its equipment caused by other contractors in PTB. It seems that had the system not been loaded with so many alarms, Guardforce would have been able to detect software problems before AOD. For those alarms that were set off due to operational errors, it is not clear from the evidence whether these were caused by lack of training of the staff by AA or the airlines or whether they were caused by the operators' own faults.

(m) Some delay was also caused by AA, which did not provide in time the General Building Management System and Building Systems Integration package for the purposes of the model tests of ACS, for which AA should be responsible.

(n) AA, as the overall coordinator of the works, should bear some responsibility for the delay in the construction, which meant that Guardforce could not carry out its work on a system where fitting-out had finished and vandalism was not so rampant.

(o) AA should have recognised that there would be problems with opening doors on AOD. AA should have assigned staff to be ready with keys and other means of opening locked doors. This would have avoided the incidents of passengers being trapped, although the incidents were more an inconvenience than a security risk.

[28]Airside Security Risks

18.74 Airside security is of utmost importance in the overall context of airport security. The Commissioners however have evidence to find that there were airside security risks at the new airport as reflected in the following four incidents, although the first one in fact did not present any such risks.

(a) Delayed entry of police motorcycles into restricted area. On 10 July 1998, a minor traffic accident inside Baggage Hall resulted in two workers sustaining slight injuries. While two ambulance service vehicles were allowed immediate entry to the Enhanced Security Restricted Area to attend to the injured, the traffic police on motorcycles experienced a delay because their siren and flashing lights had not been switched on. According to section 22 of the Aviation Security Regulations, the requirement for permits is exempted where disciplined and emergency service vehicles respond to an emergency. The established procedures of AVSECO provide that these vehicles would be allowed immediate entry if their siren and flashing lights are activated. The Commissioners consider that, in ensuring prompt and effective response to an emergency, there should be no room for misunderstanding among the parties involved of the correct procedures. As highlighted by this particular incident, either there was ambiguity in the AVSECO procedures, or there had been a failure of communication between AA and the Police. The procedures have been fine-tuned after the incident and the revised procedures have worked well.

(b) Transit passengers allowed to enter Departures Hall and board a flight without security check. This incident happened on 25 July 1998 when staff of China Airlines Limited ("CAL") took approximately 90 transit passengers from aircraft to the Departures Hall directly, without going through the required security screening. These transit passengers boarded the aircraft which took off but was subsequently recalled by CAL for re-screening of the passengers. At the material time of the incident, the ACS door at the relevant boarding gate, which would have been an effective barrier prohibiting access from the airbridge to departures Level 6, did not function. Also, the AVSECO guard stationed at the airbridge failed to stop the transit passengers from proceeding to Level 6. Although, upon notification, the AVSECO Duty Manager requested the CAL Duty Manager to undertake security screening for the passengers, the flight had already departed by the time the CAL Duty Manager decided to do so. Both the Hong Kong Aviation Security Programme ("HKASP") and the Hong Kong International Airport-Airport Security Programme clearly require airline operators to ensure security screening of their transit passengers. In the incident, CAL breached the relevant requirement and this was admitted by CAL. Furthermore, CAL should be blamed for its failure to stop the flight in time for security screening, necessitating recall of the aircraft after it had taken off. The responsibility for the malfunctioning of the ACS door in relation to the incident is set out under item [27]. As to the performance of the guards stationed at the airbridge, the Commissioners accept that they were outnumbered by the transit passengers but, nonetheless, they failed to intervene effectively to stop the group. The guards could have adopted a more robust approach to intervene. All in all, had the ACS door not malfunctioned, the incident with the resultant security risk would probably not have occurred. Following investigation into the incident, Civil Aviation Department (“CAD”) offered a number of suggestions to improve security arrangements to prevent recurrence. Some of these suggestions have already been implemented and they include putting up appropriate signs, setting up tensa barriers in airbridges to demarcate more clearly the arrival and departure channel within airbridges and location of separate transfer desks within the body of PTB.

(c) Unauthorised access to Airport Restricted Area ("ARA"). According to the records of the Police, there were a total of 55 reported cases of breach of ARA between AOD and 17 October 1998. In some of these incidents, the offenders failed to bring with them their own permits or used colleagues’ permits for convenience. According to the evidence received from AVSECO, the majority of unauthorised entries were technical in nature devoid of any criminal intent. The causes were attributed to permit holders not being familiar with the new environment at the new airport, inadequate instructions being given to them, insufficient signage during the initial stage of operation and the less than effective control over unauthorised entry whilst ACS was under test. Following implementation of some improvement measures to the signage and the overall security system, there was a marked decline in the number of such incidents in the subsequent months. While the Commissioners agree that the majority of the incidents were technical in nature, they are of the view that AVSECO should nonetheless be held responsible for its failure to prevent the 55 cases of unauthorised access into ARA in the first place. Some ARA permit holders were responsible for the inappropriate use of their permits resulting in unauthorised entry. Also, AA should be blamed for not putting up sufficient signage to indicate boundaries of the area.

(d) A KLM flight took off with baggage of two passengers who were not on board. On 8 July 1998, a KLM flight departed with the checked baggage of two passengers on board but without the passengers. The incident arose from some functional difficulties with the boarding gate readers ("BGRs") which were used to scan boarding passes ("BPs"). This necessitated manual collection and checking of the BPs stubs so as to verify the number of passengers on board. Upon verification, 10 passengers were found missing. The cabin crew then conducted a passenger head count but, unfortunately, the head count was incorrect leading to boarding staff having the impression that all passengers were on board. It was not until the two missing passengers turned up at the boarding gate that the staff realised the mistake in the head count. But the aircraft was about to take off at that time. The two passengers were subsequently arranged to depart via another airline. The investigation of CAD failed to establish whether it was human error or the malfunctioning of the BGR system at the time that had caused the incident. However, KLM was found to be in breach of the requirements in the HKASP to remove the baggage of a passenger who does not board the aircraft. This requirement is an additional safeguard for passengers' safety since all passenger baggage is security screened to comply with international standards. The Commissioners fully concur with the investigation results and are satisfied that the incident is an isolated case of failure to comply with the HKSAP procedures for passenger and baggage reconciliation. This was caused by a human error in the head count, for which KLM should be responsible.

[29] <u>Congestion of Vehicular Traffic and Passenger Traffic</u>

18.75 On AOD, there were problems with traffic congestion, congestion at lifts from Level 3 (ground level) to PTB and contra-flow movement among passengers on the down ramp from Level 3 to Arrivals Hall on Level 5. During the first week of AOD, more than 60,000 curiosity sightseers per day visited the new airport and many of them took the external buses and shuttle buses which stopped at Cheong Tat Road on Level 3 outside PTB. Traffic congestion occurred at the section of the road where passengers alighted and got on board of the buses. The situation was aggravated by the suspension of one of the two bus stops there and the non-completion of pavement work. The problem greatly inconvenienced users of the airport for a short period since AOD.

18.76 Passengers who wish to go into PTB after alighting at Cheong Tat Road can make use of the six passenger lifts and escalators in carpark 2 and Level 3. However, none of these facilities were put into service on AOD. As a result, the passengers had to make use of the two staff lifts, the down ramp leading to the Arrivals Hall and the two emergency staircases. This resulted in lift congestion and contra-flow movement among passengers along the down ramp.

18.77 To remedy the situation, the Transport Department introduced measures to re-route and divert some of the routes. AA also deployed additional staff for traffic and crowd control and installed temporary signs and barriers to direct arriving passengers. Availability of lifts from Level 3 had also increased since 12 July 1998. With these measures, the problems of congestion were resolved, particularly when the number of visitors gradually subsided after AOD. The Commissioners note the view of W51 Yuen that extraordinary increase in traffic on opening of major airport facilities is a common occurrence due to drivers circulating the roadways to find their destinations. However, on evidence, the Commissioners consider that the Transport Department, as the party responsible for approving the design and monitoring of the operation of transport facilities, should take more precautionary steps in traffic planning for the opening of the new airport. For such a significant event, the large number of curiosity visitors could be foreseeable. As for AA, the Commissioners find that it should be responsible for the insufficient signage and inadequate lift service on AOD, which eventually led to undesirable congestion of people.

[30] <u>Insufficient Air-conditioning in PTB</u>

18.78 The air-conditioning system in PTB mainly consists of the following:

(a) the pump system for supplying seawater for cooling purpose;

(b) chillers for the supply of chilled water throughout PTB; and

(c) the air-conditioning plant for the supply of cool air to the public areas.

18.79 The Young's Engineering Company Limited ("Young's") is the contractor for seawater pumps whereas AEH is the contractor for the chillers and the air-conditioning plant.

18.80 There were a number of incidents of air-conditioning failure inside PTB with different length of duration and varied causes. The insufficiency of air-conditioning was mainly due to frequent tripping of the chillers in PTB and a number of these incidents were caused by power failure, human error or technical faults. The system's design setting of temperature at 24°C instead of a more acceptable 22°C may also be a contributory factor accounting for the public perception of inadequate air-conditioning during the summer months in which the new airport opened for operation. In the tenant areas, there were delays experienced in the energisation of tenants' chilled water supply, causing insufficient air-conditioning supply to these areas. The delays were mainly caused by the large quantity of late requests from tenants for connection to chilled water supply and the failure on the part of tenants to complete or commission their air-conditioning installations. With increased working hours and labour from AA and AEH, all tenant requests for chilled water supply were processed by 13 July 1998.

18.81 Evidence received has revealed altogether 12 reported incidents of chillers shutdown causing disruption to the supply of air-conditioning to PTB. These incidents are briefly described below:

(1) *6 July 1998*. On 6 July 1998, one of the three chillers shut down during various periods for approximately five hours causing the temperature in PTB to rise by about two to three degrees Celsius. There are cross allegations from AA, AEH

and Young's as to the technical causes for the event and, without examining the system in detail, the Commissioners are not in a position to come to any conclusive view on the issue of responsibility. Young's, however, did admit that there was a faulty flow switch in the seawater pump house for which it was responsible. In the Commissioners' opinion, it appears that there was also a problem of interfacing between the systems in pump house control room (for which Young's is responsible) and the chiller room (for which AEH is responsible) and, in the that respect, AA should bear the responsibility for failing to coordinate and organise the necessary interface testing between the systems of the two contractors concerned.

(2) *10 July 1998*. On 10 July 1998, one seawater pump tripped causing one of the three chillers running to shutdown due to insufficient seawater flow. The incident was caused by human error and, for this, Young's is responsible.

(3) *12 July 1998*. Arising from a sudden energisation of a main chilled water branch, the pressure of the chilled water system dropped causing two of the four operating chillers to shutdown on 12 July 1998. AEH was responsible for the occurrence of sudden energisation, which could have been avoided if the valves were opened slowly to minimise the system pressure fluctuations.

(4) *13 July 1998*. On 13 July 1998, all the four chillers running and the secondary chilled water pumps were shutdown due to power voltage fluctuations that, allegedly, had been caused by lightning strike. To avoid future fluctuations or loss in power supply, uninterrupted power supply ("UPS") units were installed to the chiller control panels and the panel serving the seawater controls in the chiller plant rooms between 28 September and 27 October 1998. In the event, it also came to light that although the chillers had tripped and the demand for seawater had ceased, the seawater pumps continued to operate. Young's admitted that this was attributed to a small error in the control logic of the seawater

pumps within the pump house. The error was rectified on the same day.

(5) *28 August 1998*. All chillers tripped on 28 August 1998 due to lightning strike affecting power supply to the pump house. This incident was similar to the one at item (4) above. The instructions for installation of the UPS units were issued by AA on 17 July 1998. Had AA issued the instructions earlier or had the UPS units been installed earlier, or had other precautionary measures been taken much earlier, this incident and the other two incidents described in items (4) above and (7) below might have been avoided. In this context, the Commissioners opine that AA should bear some responsibility for the late instructions.

(6) *29 August 1998*. On 29 August 1998, all chillers tripped because of loss of seawater supply, resulting from power failure. Also, as alleged by AA, the electrical protection setting to the banscreen motors in the seawater pump house had been incorrectly set and Young's immediately altered the setting to rectify the problem. Although Young's alleged that the loss of power was not within its control, it should be responsible for the incorrect electrical protection setting.

(7) *30 August 1998*. Similar to items (4) and (5) above, all chillers tripped on 30 August 1998 due to lightning strike which affected the power supply. AA should be responsible for the late instructions for installation of UPS units.

(8) *8 September 1998*. On 8 September 1998, all chillers (two chillers only, as alleged by AEH) tripped due to a power failure caused by tripping of circuit breakers on Young's switchboard. Young's admitted its responsibility to the extent that the system was vulnerable due to critical control circuits not being on a dedicated supply.

(9) *14 September 1998*. On 14 September 1998, all chillers tripped due to human error whilst the contractor for the

Mechanical Building Management System carried out testing of that system. In the opinion of the Commissioners, no responsibility should be assigned except to the person who committed the error.

(10) *12 October 1998*. All chillers (three chillers only, as alleged by AEH) and the air handling units tripped as a result of a disturbance by the power system of China Light & Power Company Limited ("CLP"). CLP alleged that the incident was caused by third party damage to their underground cable. However, that responsible third party could not be identified.

(11) *22 October 1998*. The incident on 22 October 1998 was a planned shutdown to enable testing on an interface with the seawater pump house to be carried out and no party should be blamed for the incident.

(12) *28 November 1998*. On 28 November 1998, all chillers tripped due to a loss of seawater supply. The loss of water supply was caused by an unauthorised isolation of power supply to the high voltage battery charger and the associated UPS unit. Also, the UPS unit had been incorrectly set to bypass mode which prevented power backup in the incident. There is inconclusive evidence as to which party should bear the responsibility for the power interruption.

18.82 Although the Commissioners do not have the benefit of time to examine all the issues involved in greater detail, it is, however, evident that AA, AEH and Young's should bear certain degrees of responsibility for the failure of the air-conditioning system in some of the incidents. As to the problem in tenant areas, the Commissioners consider that much of the blame should lie with the tenants themselves because of their late applications for connection as well as non-compliance with the connection procedure.

[31] PA Malfunctioning

18.83 Public announcements at the new airport are made either through Central PA or Local PA. In the case of the former, announcements are made centrally from AOCC which may broadcast to all or selected areas. Local PA comprises of consoles near the boarding gates controlled by airline operators and AA staff.

18.84 AOCC is linked to the communications rooms throughout PTB via the Building System Integration ("BSI") package and the Voice Routing System ("VRS"). As both BSI and VRS were not available on AOD and sometime thereafter, announcements were made through the manual all zone ("MAZ") system, which operates through a notebook computer in AOCC and which is also connected to one of the communications rooms.

18.85 Hepburn Systems Limited ("Hepburn") is the main contractor for PA and SigNET (AC) Limited ("SigNET") its sub-contractor.

18.86 Between AOD and 16 August 1998, Central PA was down on several occasions. Most notably, on 7 July 1998 Central PA was down six times, totaling over three hours with one downtime lasting over two hours. Local PA also experienced a significant number of problems. In the first four weeks since AOD, AA recorded 194 problems out of about 50 consoles. While some problems were caused by human errors, others were caused by hardware and software problems.

18.87 Hardware problems included the late and incomplete installation of equipment, including speakers, consoles and the ambient noise-operated amplifier facility at various locations throughout PTB and the Ground Transportation Centre. This was mainly due to the lack of time and PTB not being absolutely ready. Other hardware problems included human induced damage to membranes covering the consoles and gooseneck microphones and defective consoles due to the failure of electrical components.

18.88 There were some problems with the intelligibility of announcements on some occasions such as unclear or no announcements made, and problems relating to echoing and volume. Adjustments to feedback and volume could not be made until the Rapid Assessment of

Speech Transmission Index ("RASTI") testing was completed which in turn could not be carried out until acoustic related materials were installed in PTB.

18.89 There were other software problems experienced. For instance the function which prevented overlapping announcements was not set up (zoning problem), low priority announcements blocked out more important messages (priority problem), the slow response time in the logging on process for some gates, MAZ system overriding the loading gate console causing the gates to be inoperable, instability of Central PA resulting in MAZ notebook outages, and incidents of "lock out" problems caused by fire evacuation warning announcements.

18.90 Most software problems were caused by the required tests not being performed by AOD, largely due to inadequate resources from Hepburn and SigNET. Hepburn admitted that they had a problem with a subcontractor, Univision Engineering Limited, which affected the development of an interface software to the BSI. This resulted in a delay of factory acceptance test which was not completed until the end of June 1998. There was also significant delay in performing SATs, which only began in May 1998 and completed in October 1998, long after AOD. AA and Hepburn agreed to defer RASTI testing after AOD.

18.91 A remedial programme was developed 10 days after AOD for the completion of outstanding work. Hepburn provided staff 24 hours a day during the first week of operation. Since AOD, Hepburn concentrated on resolving system integration and reliability including software problems, upgrading Local PA, level adjustments, zoning issues and hardware problems.

18.92 PA was one of the major back-ups and workarounds for the dissemination of flight information in the absence of an effective FIDS. AA is responsible for the lack of effective contingency planning. AA knew PA would not be completed or completely tested before AOD and it also knew that PA had not gone through SATs and that there were problems with the Local PA. Further it did not plan for the possibility that both PA and FIDS may not work at the same time. Fortunately there was no evidence that any passengers missed their flight as a result of gate changes. Hepburn claimed that PA was putting out about 270 calls per day from AOD despite all its problems.

18.93 Whilst the incomplete installation of some PA equipment was partly due to the late readiness of PTB, the Commissioners find that the major delay was caused by Hepburn's failure to meet its deadlines. Although there may have been frequent changes of instructions from AA, there were extensions of time granted to Hepburn. The primary reason for the delay was the inadequate resources that Hepburn and SigNET had assigned to the contract.

18.94 In relation to the physical damage made to the membranes and gooseneck microphones, it is the Commissioners' view that whilst the damage might have been caused by vandalism, the damage could have been caused by careless use by operators. All console users should be advised of the proper use of the consoles so as to prevent unknowing damage.

18.95 As contractor of PA, Hepburn is responsible for the defective consoles due to failure of electrical components.

18.96 In relation to the intelligibility problem, the Commissioners find that neither AA nor Hepburn should be responsible. Without having the acoustic related materials ready in PTB, the necessary tests would not have been useful or meaningful.

18.97 As Hepburn had delayed in its work on PA, the Commissioners are of the view that they should primarily be responsible for the zoning and priority problems. Had there been more tests and trials, these problems could have been uncovered and remedied.

18.98 The slow response time of the consoles and the overriding problem are software problems for which Hepburn should be responsible.

18.99 The issues of MAZ outages and locking problems, the Commissioners find that these were software problems, as accepted by W47 Mr Graham Morton, and accordingly Hepburn should be responsible.

18.100 Problems with PA still exist although the system is more stable with fewer faults and failures. The slow response time of PA in the logging on process was rectified early in September 1998. Repair and replacement of defective hardware was largely completed by the end of September 1998. Problems with the fire announcement were fixed around 15 October 1998.

18.101 SATs, including RASTI, were completed at the end of October 1998 while testings for the maintenance reporting terminal were scheduled to be completed by the end of November 1998. Hepburn expect confidence trials for Central and Local PAs to be completed by about March 1999.

[32] <u>Insufficient Staff Canteens</u>

18.102 There were complaints from airport staff about the lack of sufficient staff canteens. There was a specific allegation that staff had to wait for more than 40 minutes for a table and food on some occasions. The new airport has a working population of about 45,000, with about 14,600 people working daily in PTB. A total of four staff canteens were planned to cater for the need of staff and they altogether provide 954 seats. The Commissioners find from the evidence that, right from AOD up to 13 July 1998, there was only one staff canteen in operation. Two others were not opened until later that month and the last one came into service only on 15 October 1998. Therefore, the full planned canteen capacity was not available during the initial period of airport opening. Furthermore, owing to the large number of visitors around that time, the alternative to use the commercial catering facilities at PTB which were crowded with visitors did not help the situation.

18.103 Upon review of the evidence, the Commissioners note that the original concept was to build a main staff canteen within the maintenance building alongside PTB but, for various reasons including cost and profitability, the proposal did not materialise. Also, there did not seem to have been a scientific and realistic assessment of the catering requirements for staff working at the new airport. In this regard, the Commissioners consider that AA should be responsible for its poor planning of staff catering facilities. The planning ratio of 15 to 1, assuming 14,600 people as against 954 seats in staff canteens, appears to be on the low side. Furthermore, AA should be blamed for not ensuring that all the four planned canteens could open for service right from AOD.

[33] RFI on Air Traffic Control Frequency

18.104 CAD has been receiving reports from airline pilots regarding RFI on air-ground Very High Frequency radio communication channels used by air traffic control since late 1994. To address the problem, CAD used spare frequencies to replace the affected ones for communication in the event of interference and had brought in six additional frequencies as extra backup for air traffic control since 1996 to safeguard flight safety.

18.105 Investigation by the Office of Telecommunications Authority showed that the sources of RFI were in the form of spurious or intermodulation signals originated from some unknown paging stations along the coastal areas in the Guangdong Province. The Mainland authorities have adopted a range of measures to tackle the problem including dismantling radio transmitters on top of hills, and closing down offending paging stations. Some cities have also introduced tighter control measures on paging stations such as limiting their transmission power and requiring them to install filters and isolators. Since May 1998, a Technical Working Group was established with technical experts from Hong Kong and the Mainland authorities to step up cooperation in addressing the RFI issue. A Task Force has also been formed between operational personnel of Hong Kong and the Mainland authorities for quick exchange of RFI information, if necessary.

18.106 The Commissioners are satisfied that both the Hong Kong and Mainland authorities attach great importance to flight safety and strenuous efforts are being made to eliminate RFI completely. No finding is therefore called for in respect of this problem.

[34] APA Malfunctioning: a Cathay Pacific Aircraft was Damaged when Hitting a Passenger Jetway during Parking on 15 July 1998

18.107 APA is a laser scanning device that directs the pilot to park the aircraft through a real time display unit. On AOD, three out of the 68 APAs (comprising 28 Building Mounted APAs, 40 Gantry APAs) at the new airport were not functioning. In an incident on 15 July 1998, a Cathay Pacific aircraft was damaged during parking, allegedly as a result of the malfunctioning of a Gantry APA at a frontal stand. As from that day, all APAs were suspended from use. Prior to that, there were occasions on which the Gantry APAs were unable to give necessary directions to the pilot. According to Safegate International AB ("Safegate"), the contractor for the design and maintenance of the APA system, problems with the Gantry APAs was due to the height of the Gantry which affected the laser scanning angle, the stop position and the aircraft type in question. Another contributing factor was that Safegate staff had inadvertently disabled the auto-calibration function of the system, which could have detected a sensor problem. To address the problem, enhancement was made to the software of Gantry APAs to increase the effective viewing angle of the laser. As for the Building Mounted APAs, there were incidents of non-operational problems. The problems were caused by: (a) curtailed airflow within the display units as a result of installation of sponge washable air filters; and (b) the unstable voltage experienced at the new airport. To rectify the problem, Safegate removed the sponge filters and optimised the size of the thermo fuses and resistors to accommodate the voltage situation. Since 12 September 1998, all APAs at frontal stands have been put back to service and as at 17 September 1998, all Gantry APAs were successfully tested before being put to use.

18.108 In the incident on 15 July 1998, the APA was apparently not working properly and the air marshall had to give hand signal the pilot to stop. Unfortunately, the pilot apparently misunderstood the signal of the marshall as a direction to move forward. When the pilot realised the emergency stop signal and stopped the aircraft, it had overshot by about six metres and had hit the passenger jetway. The marshall could have pressed the emergency stop button on the control panel of the APA to effect the display of "Stop" message on the display unit so as to direct the pilot to stop. However, the control panel was outside the reach of the marshall at that time and the marshall had therefore to resort to manual signalling.

18.109 There were cross allegations between AA and Safegate as to the general causes for the malfunctioning of APAs. However, judging from the evidence and having regard to the fact that Safegate had to undertake some remedial measures after AOD, the Commissioners come to the view that Safegate should be responsible. As for the incident on 15 July 1998, Safegate should be held responsible for the malfunctioning of the laser sensor and, also, the inadvertent act of its staff to disable the auto-calibration function of the system. The Commissioners find comfort in that AA has agreed to reposition the control panel, obviously to enable air marshall to reach it whilst working on the ramp.

[35] <u>An Arriving Passenger Suffering from Heart Attack not being sent to Hospital Expeditiously on 11 August 1998</u>

18.110 There was a complaint that on 11 August 1998, an arriving passenger with heart attack on board China Southern Airlines flight CZ3077 from Hainan to Hong Kong was not sent to hospital expeditiously. The evidence shows that it took thirteen minutes for the ambulance to reach the patient after FSCC received an emergency call through “999” at 10:56 am. In between, five minutes have been spent by the ambulance in waiting at the apron gate for the ACC escort vehicle to arrive.

18.111 The Commissioners note that when FSCC received the emergency call, the relevant aircraft was already on the apron. Apparently, the cabin crew did not notify the ACC or AOCC about the sick passenger on board before landing. Hence, no arrangement had been made to put an ambulance on standby on arrival of aircraft. Though the delay did not result in a major incident, the Commissioners have to hold the China Southern Airlines responsible for failing to notify the airport about the sick passenger before landing. After the incident, AA has reminded airlines that the flight crew should notify the airport before landing if a passenger was taken ill on board.

18.112 Although both the ambulance and the ACC escort arrived at their destinations within their normal response time, the Commissioners find that better coordination and communication between FSCC and ACC could have helped to cut down the response time in this incident. From the evidence, the five-minute waiting time for the ambulance at the apron gate was to some extent caused by the need for FSCC to contact ACC indirectly through the Airport Main Fire Station Rescue Control ("AMFSRC") for an escort. In the light of the incident, AA and FSD are arranging a direct line to be installed between FSCC and ACC so that, in future, requests for ACC escort vehicle do not have to go through AMFSRC.

[36] Fire Engines Driving on the Tarmac Crossed the Path of an Arriving Aircraft on 25 August 1998

18.113 On 25 August 1998, four fire engines drove across the runway to attend to an incident of a Japan Airlines Company Limited ("JAL") aircraft without obtaining permission from the Air Traffic Control ("ATC"), forcing a Cathay Pacific flight to abort take-off and a China Eastern Airlines flight to delay landing.

18.114 According to the report of FSD on the incident, the four fire engines were despatched to respond to an incident of a JAL aircraft. The Rescue Leader of the four engines radioed the ATC tower for clearance to cross the runway. Before he could obtain the necessary clearance, the driver of the first fire engine speedily drove across the runway without confirming permission from ATC nor the Rescue Leader. As the first engine was crossing the runway at high speed, the Rescue Leader considered that instructing it to return would only lengthen the time of the fire appliance staying on the runway, further obstructing runway operation. Seeing that the aircraft at the threshold of the runway was stationary, he quickly followed with the remaining three appliances and dashed across the runway.

18.115 According to CAD's report, the Rescue Leader of the fire engines only reported on radio that they were responding to the request for inspection of the JAL aircraft without asking for specific permission to cross the runway. When ATC saw the fire engines crossing the runway, it immediately instructed a Cathay Pacific Airbus A340 aircraft which had just been cleared for take-off to abort take-off . An incoming China Eastern Airlines Airbus A320 was also instructed to discontinue its approach. No danger to safety was involved.

18.116 The procedures for vehicles entering the runway is clear and unmistakable. All relevant communication equipment was functioning properly in the incident. The Rescue Leader and the driver of the first fire engine were responsible for the failure to obtain clearance from ATC before crossing the runway. They had been disciplined by FSD subsequent to the event. FSD also reminded its personnel of the proper procedures for appliances to seek permission from ATC before entering the runway. The Commissioners opine that FSD has taken appropriate follow-up action on the incident.

[37] A HAS Tractor Crashed into a Light Goods Vehicle, Injuring Five Persons on 6 September 1998

18.117 On 6 September 1998, a tractor of HAS crashed into a light goods vehicle (a control van), injuring five persons. The driver of the tractor towing two empty containers and an empty dolly was driving in the restricted area of the airport. As he was driving between two lines of containers, his view was partially blocked on the left while he was going out of the area and he was not aware of the arrival of the control van. The tractor collided with the control van passing horizontally in front. As a result of the collision, five persons on the control van sustained injuries. All but two were immediately discharged after medical treatment and none was hospitalised.

18.118 The Commissioners consider this incident of a moderate nature not only because five persons were injured but also because it was a traffic accident occurring inside the restricted area of the new airport. It is necessary to maintain the new airport as a safe place, and the incident may give rise to an impression to the public that the airport itself is not running safely and smoothly. The incident report of HAS found that the driver of the tractor had not followed the proper driving procedures in stopping his tractor to ensure road clearance in front when he was driving between two lines of containers. As a result of Police investigation, prosecution was made against the driver for careless driving. The Commissioners are satisfied that HAS and the Police have investigated into the incident thoroughly.

[38] Tyre Burst of United Arab Emirates Cargo Flight EK9881 and Runway Closures on 12 October 1998

18.119 On 12 October 1998, United Arab Emirates flight EK9881, a cargo B747-200 aircraft leased from Atlas Air, Inc. ("Atlas Air"), sustained tyre burst on departure for Dubai, leaving behind tyre debris on the runway. Tyre fragments covered an extensive area of the runway. The runway was closed for 40 minutes for removal of the tyre debris. About one and a half hours after take-off, the aircraft returned to Hong Kong because of a slight hydraulic problem, damaging runway lights on landing. The runway was closed twice, 39 minutes and 20 minutes respectively, for inspection of the runway conditions and emergency repairs to the lights. Further repairs to the lights were made overnight.

18.120 The incident, which necessitated the closure of the runway three times a day, had an impact on the operation of the airport. During the runway closures, four aircraft were diverted to alternative airports, 42 arriving flights were delayed between 15 and 69 minutes and 88 departing flights were delayed between 15 and 75 minutes. It is on this basis that the Commissioners treat this incident as a moderate one. At the time of the incident, the relevant freighter aircraft was operating under a lease agreement between the Emirates Airline and the Atlas Air and was fully controlled by the Atlas Air crew. Accordingly, Atlas Air has to be held responsible for the incident.

[39] Power Outage of ST1 due to the Collapse of Ceiling Suspended Bus-bars on 15 October 1998

18.121 On 15 October 1998, there was a structural failure of a section of ST1's power distribution system linking ST1 to a local substation causing disruption to ST1's operation. A large section of the ceiling suspended bus-bars and cables used in the distribution of commercial power to certain parts of the building collapsed around 6 am on 15 October 1998, cutting power to mainly the eastern half of the terminal building. This resulted in a number of airline offices losing power, limiting their ability to communicate with their counterparts who were required to be informed of cargo movement, both in and out of ST1. The power failure affected ST1's operational efficiency and slowed down the processing time for some types of cargo. The Express Centre and the Perishable Cargo Handling Centre were operating normally. Temporary power was restored to the airline offices by early evening of the same day and, for operating computers, telephones and facsimile machines, some 12 hours after the failure. Temporary measures were also employed to restore power to other affected areas. Permanent power for air-conditioning and full lighting in the offices was restored on 20 October 1998 and all other affected areas of ST1 were connected with permanent power on 22 October 1998.

18.122 There is insufficient evidence to determine who should be responsible for this incident, whether it was HACTL or its contractor who installed the ceiling bus-bars, or the power company.

Major Problems:

[40] FIDS Malfunctioning

18.123 Flight-related information is the driving force of operations and of movement of passengers in all airports, particularly for any highly sophisticated and busy airport like the one in CLK. After touching down at the new airport, the arriving aircraft is directed to either a frontal stand bordering PTB or a remote stand for parking and disembarkation of passengers. The stand is allocated by the ACC based on flight schedules and estimated time of arrival ("ETA") obtained from the ATC tower operated by CAD. With knowledge of the allocated stand, the RHO serving the arriving aircraft can then proceed to the stand to disembark passengers and unload baggage to be deposited on the reclaim lateral assigned to the flight. At the stand, the plane can be serviced and prepared for its departing flight at the scheduled time of departure. Departing passengers check in with their baggage at either the check-in desks on Level 7 of PTB, or at the In-Town Check-in facility at two of the major AR stations. Checked-in passengers are notified of boarding gate numbers, boarding and departure times. Their bags are injected into the Baggage Handling System ("BHS") which are automatically sorted to departure laterals allocated according to flight schedules and aircraft stands. With knowledge of aircraft stands, the relevant RHOs collect the bags from the departure laterals and load them onto the aircraft.

18.124 All these steps are connected in the cyclical process of arriving and departing flights. For each step, relevant information should be available to the relevant operators in advance to give them time for preparation and to maintain the timeliness of the entire process. Delay in one step inevitably sets back the next. The information required for operations can be provided by computerised means or by more manual means of allocating aircraft stands on paper and relaying flight-related information by conventional means of communication.

18.125 FIDS at the new airport is a highly computerised means of generating, processing, disseminating and displaying flight-related information. FIDS was designed with a high level of integration between the various systems that supply and use flight information. The ultimate user and owner of FIDS, as of most systems at the new airport, is AA's AMD. G.E.C. (Hong Kong) Ltd. ("GEC") was the main contractor for the delivery of software and hardware. The FIDS software was developed by GEC's subcontractor, Electronic Data Systems Limited ("EDS").

18.126 In the eyes of the public, FIDS "crashed" or "broke down" on AOD and had problems for about a week or so thereafter. Specifically, meeters and greeters, and arriving and departing passengers saw blank liquid crystal display ("LCD") boards and FIDS monitors, or incomplete, inaccurate or outdated information displayed. 137 out of 142 available LCD boards and 1913 out of 1952 available monitors worked without interruption on AOD. While there were some hardware problems and display server problems that affected the availability of devices and the update of information displayed, the lack of reliable flight information was mainly caused by problems with the FIDS software, as discussed in this report.

18.127 For flight-related information to be displayed, operators and systems must first generate it. Operations on the apron are at the heart of airport operations and stand allocations generated by ACC on the TMS for arriving (and therefore departing) aircraft are vital flight information. TMS is a resource allocation software sharing a database with FIDS and interfaced with FIDS and FIDS Man Machine Interface ("MMI"). TMS was supplied by The Preston Group Pty Ltd (“Preston”), EDS’ sub-contractor. Difficulties allocating stands for arriving aircraft in ACC in the small hours on AOD resulted in delays in aircraft landing and parking. This triggered a series of delays, which threw apron operations and eventually the whole airport into a vicious cycle of delays. A consequence of delayed allocation of stands that was visible by noon on AOD was a congested apron, which became full from about noon to 5 pm and again from 8 pm to 11 pm. Aircraft had to queue up for the next available stand. RHOs’ work plans were thrown to the winds by the changes in aircraft arrival times and stands, and they had to adjust manpower and vehicles to meet the real situation. FIDS was unable to provide RHOs with real-time information on arrival times and the location of the aircraft, causing delay to the provision of service to the arriving aircraft. At an emergency meeting at 4 pm on AOD, AA, and RHOs agreed to set up a whiteboard at the Airport Emergency Centre (“AEC”) displaying up-to-date flight-related information. This put strain on RHOs’ resources who had to send its staff to AEC to obtain the vital information to support its operation. Everyone tried to convey information through Trunk Mobile Radio (“TMR”) or mobile phones. However, they experienced difficulty in getting a channel or line due to the unusually high demand on the TMR and mobile phones network.

18.128 The peculiar events in the ACC on AOD triggered the situation of delay upon delay on the apron. Difficulties in allocating stands started at around 1 and 2 am on AOD, when ACC operators were unable to execute the flight swapping function on TMS. The Commissioners have identified the main problem in this respect as the lack of training on the part of ACC operators on the proper flight swapping functionalities of TMS and lack of assistance present in the ACC at that crucial moment, resulting from poor coordination within AA and between GEC, EDS and Preston.

18.129 At about 10 pm the night before AOD, operators unfamiliar with a system prompt for linking arriving and departing flights by registration number mistakenly executed the link for ferry flights arriving from Kai Tak. W34 Mr Peter Lindsay Derrick of Preston gave evidence that he too was not familiar with this prompt. When flight movement sheets were received at about 1 am from Cathay Pacific, ACC operators started to carry out the required flight swapping. ACC operators were not trained on all methods of flight linking and their progression, and encountered difficulties executing the command on TMS and later Stand Allocation System ("SAS"). SAS hung up and could not be used. Assistance was late in coming, with W24 Ms Rita LEE Fung King of the Information Technology ("IT") Department of AA only arriving at ACC about 6:30 am because she was uncontactable since 3 am, W34 Derrick arrived at ACC at 12:30 pm, due to a six-hour delay for AA to obtain an access permit for him and to escort him to ACC. W34 Derrick was able to clear most flight swapping problems.

18.130 Meanwhile, ACC had resorted to manual allocation of stands on paper, followed by entry and confirmation of the allocations into TMS through FIDS MMI, which would enable FIDS to disseminate and display the information on FIDS display devices. The main problem W24 Lee and operators encountered in flight swapping and inputting and confirming stands on TMS was the slow system response. There were other problems that annoyed operators but did not hamper their operations significantly, such as the intermittent shutdowns of the TMS Gantt chart, and green bars on the TMS Gantt chart indicating invalid ETAs that were earlier than STAs by more than 15 minutes, caused by the incorrect ETAs obtained from the CAD radar tracker processor.

18.131 While trying to resolve flight swapping difficulties and confirming stand allocations, W24 Lee would only confirm a stand when this was requested urgently by Airport Operations Control Centre ("AOCC") or an airline on the phone. There was also a practice inherited from Kai Tak of confirming a stand allocation only upon receipt of ETA, which when combined with late receipt of ETA, meant late display of allocations to RHOs and delayed allocation of gate and boarding gate desks for airlines. These delays had obvious knock-on effects for RHOs and airline operations resulting in the chaos on AOD.

18.132 Slow system response was the most serious problem that plagued FIDS generally. There were conflicting versions from AA and Preston on the response times, ranging from three seconds to 15 minutes. W24 Lee said that there was slow response of workstations in the ACC about 80% of the time on AOD. W26 Mrs Vivian CHEUNG Kar Fay reported that from 8 am to 11 am on AOD, it took 20 to 25 minutes for the FIDS workstation at AOCC to allocate a baggage reclaim belt. System slowness persisted after AOD. Serious problems surfaced on Day Five when the FIDS database experienced frequent locking and very high CPU utilisation. Major system changes were effected that night to solve the WDUM problem and locking in TMS. System performance improved significantly after that. Measures were also taken to increase memory in FIDS workstations in ACC, AOCC and Baggage Control Room ("BCR") in the first few days of AOD.

18.133 SAS hung up or "crashed" at about 2:30 am on AOD when operators tried to do flight swapping because a swap to one pair of departure and arrival flights caused transient illogicality to other pairs of flights of the same aircraft, in that departure time was earlier than arrival time. City University ("City U") designed the system not to accept illogical states so as to prevent operational error. City U explained that the system could have been used for flight swapping if the operator had adjusted the departure time thus removing the illogical state, before carrying out the swap. City U carried out modifications to SAS after AOD to permit input of illogical data.

18.134 To sum up, the specific causes for the deficiency of FIDS were as follows:

(a) Software problems that were manifested in slow system response time.

(b) Lack of comprehensive training on the part of ACC operators on TMS flight linking functionality.

(c) Assistance was not readily available to the ACC operators when they started to experience difficulties with flight swapping.

(d) Practice of ACC operators to confirm stands only after ETA was received which in some cases was 15 minutes before landing of aircraft.

(e) Green bars on the TMS Gantt chart caused by ETAs from CAD being earlier than STAs by more than 15 minutes, though this was not a major problem.

Broad Causes and Parties Responsible

18.135 In Chapter 13, the Commissioners have analysed the evidence presented to it on factors that contributed to the malfunction of FIDS into five broad areas: compression of software development time, insufficient software testing and rectification of software problems before AOD, insufficient training or practice of operators on software functionalities, lack of or late confirmation of stands and poor communication and coordination (within AA, between AA and its contractors and between contractors and subcontractors). Each cause should be considered in combination with the other four broad causes, as well as contributing factors and specific causes discussed in the events that took place on AOD.

(a) Compression of software development time

18.136 The development of the FIDS software got off to a dangerous start when discussions on detailed functional requirements, as set out in the system segment specification ("SSS") were prolonged for an extraordinary 14 months. The Commissioners find that this loss was the most crucial slippage and was caused by the late involvement of AMD in the negotiations and also to the ambiguity of the particular technical specifications ("PTS") drafted by AA's consultants in the early days, with which the SSS had to comply. AA's Project Committee approved a payment of HK$89.7 million to GEC for delays and variations up to 10 December 1997. It appears from the justification for this payment that AA, and not GEC or EDS, must be responsible for this crucial set back.

18.137 The outcome of clarification of AMD's requirements was an agreement by AA and EDS that EDS would develop the software from scratch some 17 months after the contract commenced, as software already developed for other airports could not be modified to the extent required by the SSS. The option to buy a ready made product developed by other companies was briefly considered and dismissed. The new timetable for delivery, testing and commissioning of builds of software was aggressive and no further slippage could be afforded.

18.138 Delays continued in the delivery of builds and various tests revealed many problem reports (“PRs”) that had to be resolved for FIDS to work efficiently. In June 1998, AA was aware of at least 38 major operational PRs that would affect the efficiency of FIDS. As far as possible they cited workarounds for each PR, but some PRs involved system bugs that AA and EDS had little time to cure. W44 Mr Chern Heed told the Commission that there were new developments to FIDS and TMS functionality and workarounds right up to a few days before AOD and that TMS was usable only three or four days before AOD.

18.139 From the evidence, it appears to the Commissioners that on AOD, the new airport was dependent on a critical system that was at best workable on workarounds. At least, this put operators under additional work pressure, and it certainly created risks that the system might suffer significant failures. The Commissioners are of the opinion that compression of software development time was the most fundamental and significant cause for the problems encountered with FIDS, as it forced testing, problem resolution and training for operators to be severely compromised. FIDS should have been completely integrated, tested and stable for a suitable period of time before AOD to enable training and familiarisation for operators. The responsibility for slippage in the development of FIDS from the end of 1997 to AOD lies with both AA and EDS, though it remains a contractual matter between AA and GEC and between GEC and EDS.

(b) Insufficient testing and rectification of software errors before AOD

18.140 The Commissioners find that FIDS responded slowly, against PTS requirements of initial response to operator input of 0.5 second and final response to 90% of updates of 2 seconds. On the evidence which was corroborated by expert opinion, slow response was caused by problems with the WDUM process and a small pool memory in the Oracle database. The two problems with WDUM, excessive CPU utilisation and deadlocks had been identified before AOD but obviously not resolved.

18.141 The Commissioners note that AA should have engaged assistance from Oracle consultants on resolving problems with the Oracle database much earlier than they did on 3 July 1998. These consultants were able to identify and resolve the problems after AOD, and no doubt could have done so before AOD.

18.142 The Commissioners also note that sufficient testing and rectification of software errors revealed in testing was indispensable for an efficient FIDS on AOD. From the evidence, it appears that testing was compromised and often sacrificed at the altar of meeting AOD, with the consequence that problems that could well have been avoided with proper testing and rectification of errors, were encountered on AOD. The parties were aware of the kinds of tests that should have been carried out before the system could properly be said to be ready, but their judgement and willingness to forego these tests in the face of an imminent AOD were affected by the compression of time available to them.

18.143 One of the most important tests to prepare FIDS for live operations was the stress and load test contemplated in late June 1998. However, this test was deferred to after AOD, because the time remaining to AOD would better be used to rectify the problems already identified and FIDS was not stable enough to receive such a test. Witnesses from AA, EDS and GEC and the Commission's experts all agreed that a stress test would have thrown up problems with FIDS relevant to AOD. AA, GEC and EDS are responsible for this decision.

18.144 Bearing in mind that any test is only as good as the measures taken to resolve the PRs revealed by it, and considering the limited time EDS and AA had to solve PRs before AOD, it is uncertain if a stress test would have saved the day. Yet, the Commissioners note that it was industry practice to carry out the test before operations. This highlights the serious risks that AA faced with their operation systems in the build-up to AOD and the dire need for a global contingency plan.

18.146. The Commissioners are of the opinion that GEC and EDS as contractor and sub-contractor for the supply of FIDS are both responsible for the problems encountered with FIDS, including problems with the Oracle database, with EDS being mostly to blame. As between EDS and Preston, the Commissioners find it difficult to decide on responsibility. The evidence is not clear whether the software problems of FIDS was attributable to those relating to the FIDS software developed by EDS or the TMS software developed and supplied by Preston.

(c) Insufficient training and practice of operators on software functionality

18.147 The Commissioners find that the problems encountered in the ACC with flight swapping and entering data and confirmations into TMS were problems with TMS/FIDS and were not the fault of ACC operators. The Commissioners are not satisfied on the evidence that any of the problems in the ACC, BCR or at Common User Terminal Equipment ("CUTE") workstations were caused by the inexperience or error of operators. The ACC operators were experienced, but unfortunately they were not trained as to the implications of the progression of the methods of flight linking and were not familiar with the prompt linking flights by registration numbers.

18.148 The Commissioners find that operators were trained on old versions of software that were subsequently revised or had functionality added to them. This rendered training less effective, and resulted in some duplication of time and effort in training. The Commissioners find that the inadequate training was a major contributing factor to problems on AOD. Operators, through no fault of theirs, needed to be trained to know the functionalities and workarounds. The Commissioners find that the inadequate training was caused by the compression of time caused by continued slippage in the development of FIDS. AA must be primarily responsible for the resultant inadequate training, while some of the responsibility may be apportioned to GEC, EDS and Preston for not providing all functionalities in training.

18.149 Finally, the Commissioners find that there was a lack of coordination or understanding between AA and City U that SAS was programmed not to accept illogical departure and arrival data, causing further difficulties to ACC operators. There is, however, insufficient evidence for the Commission to decide the apportionment of responsibility between AA and City U on this issue.

(d) Lack of or late confirmation of stands

18.150 It is clear to the Commission that the failure to promptly confirm stand allocations resulted in delayed information to users and operators, slowing down their operations. ACC operators could not confirm allocations promptly because they were hampered by difficulties with TMS and because of the practice of not confirming allocations until ETA was received.

18.151 W24 Lee gave evidence that she was so occupied with resolving problems with flight swapping since she arrived at ACC at 6:30 am on AOD that she would confirm allocations made manually by the other operators only when she received an urgent request. Even then, not all confirmations successfully passed through the first time, requiring her to unconfirm and reconfirm. This was not quick enough for the situation on the apron, which was quickly filling up. The same findings on the inefficiencies of FIDS and TMS apply here.

18.152 Delays in confirmation were also the result of the practice of confirming an allocation only after ETA was received, compounded by late receipt of ETA. AA and in particular W23 Mr Alan LAM Tai Chi should be responsible for adopting this practice, which was changed after AOD.

(e) Lack of communication and coordination

Within AA

18.153 The Commissioners find that AMD's concerns about the delay in the software programme and compression of training and testing were not fully taken into account and not properly addressed by Project Division ("PD"), a reflection of the general lack of coordination between PD and AMD as documented in ADSCOM documents and the report of

Booz-Allen & Hamilton.

18.154 It appears that W44 Heed was not informed of the decision by PD and IT department to postpone the stress and load test.

18.155 Poor coordination within AA was also the cause of the unavailability of expert and other IT support for operators in the ACC in the early morning of AOD. This was especially condemnable given the prior knowledge of all concerned that TMS was not stable and that a method of operations using SAS that doubled the effort required would be adopted. The delay in issuing W34 Derrick with a permit to access ACC was inexcusable and regrettable.

18.156 Better coordination and planning might have procured the assistance of Oracle Systems Hong Kong Ltd consultants early enough to save the day.

18.157 Poor coordination was also evident in the contingency plan consisting of whiteboards, which was not clear to operators as to when these should be employed. This meant that when FIDS could not be relied on for information, the operators of the airport community had no clear knowledge as to when and where the whiteboards would be put up, and what they were required to do.

18.158 The Commissioners find that W3 Dr Henry Duane Townsend, the Chief Executive Officer ("CEO") of AA, and the rest of AA management and relevant departments and divisions are to be blamed.

Between AA and other parties

18.159 The Commissioners find that AA is to be blamed for not informing CAD that it would use ETA from the radar tracker without prior authorisation or screening, and thus for the problems caused by the invalid ETA, causing green bars on the TMS Gantt chart.

18.160 The Commissioners also find that AA must take the blame for not consulting EDS and Preston before AOD on the merits of using

TMS only to input stands allocated, and not to use TMS as an optimisation stand allocation tool.

18.161 The lack of communication between AA and City U also contributed to the development of SAS not to accept illogical states, resulting in the system hanging up in the morning of AOD, though the Commission do not find sufficient evidence to apportion responsibility between the two.

Between GEC, EDS and Preston

18.162 GEC is responsible for not communicating with EDS and thus misrepresenting to AA that it would take only a short time to revert to development of standalone builds.

18.163 The Commissioners find that both EDS and Preston are responsible for not ensuring that ACC operators were aware of the implications and the correct method of usage of the prompt linking flights by registration numbers, resulting in problems for ACC operators in the early morning of AOD, which triggered a series of delays on the apron and in the airport in general. On the evidence available, however, the Commissioners are not able to apportion blame between them.

Other matters

18.164 The Commissioners find that GEC as main contractor must be responsible to AA for the defective monitors and LCD boards, while AA is responsible for cable problems that caused display devices to malfunction.

18.165 To the public, AA is responsible for failing to ensure that FIDS worked for smooth and efficient airport operations on AOD and the week after. As a result, the efficient movement of passengers was not achieved and airlines and service providers were seriously affected in their operations.

18.166 120 of the 2,057 monitors required under the contract were replaced in the three weeks after AOD. According to W22 Mr Edward

George Hobhouse, the expected failure rate of monitors was 10% a year.

18.167 W26 Cheung and W28 Mr Anders YUEN Hon Sing testified that FIDS performed efficiently and stably from about a week after AOD. Representatives of Cathay Pacific gave evidence that information from FIDS was largely accurate by Day Four to Five and that they regained confidence in FIDS a week after AOD. RHOs gave similar evidence. There was apparently nothing fundamentally wrong with FIDS, and it has worked efficiently and smoothly since late September 1998.

[41] CHS Malfunctioning

18.168 Cargo operation is one of the critical elements in the operation of the new airport and the efficient and speedy handling of air cargo has played a vital role in maintaining the vibrant economic growth of Hong Kong. Section 6(2) of the Airport Authority Ordinance expressly provides that AA shall have regard to the safe and efficient movement of air cargo. HACTL, the only cargo terminal operator ("CTO") at Kai Tak, had established itself through the last two decades as the largest and one of the most efficient cargo handling operators ("CHOs") in the world. The US$1 billion ST1 at the new airport is one of the world's most sophisticated cargo terminals. In CLK, cargo operation was shared between HACTL and Asia Airfreight Terminal Company Limited ("AAT"), who were assessed to cater for about 80% and 20% of the expected cargo capacity of the new airport respectively. Due to their importance, the readiness of the two cargo handling facilities had always been considered by AA and Government as a critical AOR issue.

18.169 In the HACTL franchise, HACTL agreed to provide 75% throughput capacity out of the full capacity of 2,400,000 tonnes (not including the annual capacity of 200,000 tonnes of the Express Centre) by 18 August 1998. This throughput capacity was raised by HACTL from 50% for April 1998 to 75% on AOD. Although the contractual date was over a month after AOD, HACTL had promised to use its best endeavours to get ST1 and the CHS ready for operation on AOD to provide a certain percentage of its yearly throughput capacity.

18.170 While AA and Government were always concerned about the constant slippage in the construction programme of ST1, there was no suspicion that CHS had any problems. In fact, HACTL never reported any problem with CHS. Despite the delay, HACTL obtained a TOP for ST1 on 3 July 1998.

18.171 On AOD, cargo operation at the new airport can be described as nothing but chaotic. Ramp space at the northern boundary of both ST1 and AAT's building was full of cargo. For AAT, whose system is much less sophisticated than that in ST1, the difficulties experienced and the impact thus caused were relatively small and manageable than HACTL's. That is not to say that there was nothing wrong with AAT's operation. On AOD and a few days thereafter, an enormous backlog of cargo was built up which led to a heavily congested working environment, both within the AAT's terminal and on the ramp interfacing with it. The backlog seriously hampered the processing of daily inbound cargo leading to a snowballing of unprocessed cargo. One of the main causes of AAT's difficulties on AOD was the inadequate coordination between AAT and RHOs in the hand-over of cargo from RHOs to AAT. Furthermore, AAT staff was not too familiar with handling live loads of cargo in the new environment and using new equipment because they did not have adequate training. For this AAT should be responsible, although on the inadequate coordination, RHOs should share a small part of the responsibility.

18.172 A detailed description of ST1's CHS is set out in Chapters 11 and 14. Suffice to say that it consisted of 5 levels, namely, Level 5 – Community System for Air Cargo ("COSAC 2"), Level 4 – the Resources Management System, Level 3 – the Logistic Control System ("LCS"), Level 2 – the Programmable Logic Controller ("PLC") and Level 1 – the mechatronics of CHS which perform the work of cargo handling. The main components on Level 1 are the Container Storage System ("CSS") and the Box Storage System ("BSS"). Both CSS and BSS have stacker-cranes which pick up cargo from automatic transfer vehicles ("ATVs") or conveyor belts and lift it to the assigned compartment for storage and retrieve it from the compartment whenever needed. The equipment are mechanical, electrical and electronic and are called mechatronics. Although LCS is a single computer system, it is linked separately to CSS and BSS, giving orders through PLC for the two systems to perform work independently or collectively. CSS was built by Mannesmann Dematic AG Systeme ("Demag") on the east and west sides of ST1, and on AOD, the whole of the west side, namely W1, W2 and W3 were to be used together with a part of the east side, E1. BSS, on the other hand, was built by Murata Machinery (HK) Ltd ("Murata") and is divided into north and south of ST1. The design of CSS and BSS is modular in nature, which means that each portion of the systems is able to work independently so that failure of one portion would have little effect on the capability of the others.

18.173 A chronology of the problems with ST1 and CHS is set out in paragraph 11.10 of Chapter 11. In summary, HACTL experienced difficulty with the operation of ST1 in the early morning on AOD. Operation of CSS was turned into manual mode. The manual mode of operation created inventory inaccuracies for the upper levels of CHS due to operators keying in inaccurate information of the location of the unit load devices ("ULDs"), or their delay or omission in inputting the data. There was a backlog of unprocessed cargo as a result of the slow operation of the system in manual mode. The manual mode also adulterated the inventory of and record of locations of ULDs, necessitating a physical check of the inventory. In the small hours of Day Two, when HACTL conducted an inventory check, the inventory records were inadvertently deleted. This gave rise to serious suspicion that there was something wrong with the systems. At about 3 pm on Day Two, HACTL announced a 24-hour embargo on export bulk cargo and import cargo on passenger flights except urgent items. On Day Three, HACTL imposed a 48-hour embargo except urgent items. On Day Four, a 9-day moratorium on all cargo on all aircraft (except inbound and outbound urgent items) was announced. It was also announced that cargo at ST1 would be moved to Terminal 2 for storage and distribution. On 16 July, HACTL announced a four-phase recovery programme for air cargo services using both ST1 and Terminal 2 in Kai Tak. By 24 August 1998, HACTL was handling all cargo at ST1, some 8 days ahead of the recovery programme. Details of the recovery programme are summarised in paragraph 11.13 of Chapter 11.

18.174 Prior to 15 July 1998, HACTL had announced having computer system difficulties or software problems in its press releases and public statements. However, since 15 July 1998, HACTL has changed its emphasis to electrical and mechanical faults caused by the environment and that the computer software problem was remarkably downplayed.

18.175 HACTL attributed the causes of the problems to a number of factors, such as the delay in the completion of construction works, dust contamination and shortage of dollies. Few of the alleged causes could be attributed to HACTL's own fault. In support of its case, HACTL appointed two experts, namely W52 Mr Max William Nimmo and W53 Mr Jerome Joseph Jr. Day who produced a report in this inquiry. They were of the opinion that there was nothing wrong with CHS and that the throughput capacity of the system was available and capable to deal with the cargo load on AOD. In short, they were of the view that as CHS was operating without any problem on the last three days prior to AOD and there was sufficient throughput capacity based on the figures obtained for this 3-day period, there was no reason why it could not cope with the live load operation on AOD. HACTL's experts opined that the increased operation of CHS in manual mode as opposed to automatic mode was due to the operators' wrong perception that LCS-CSS was operating slowly when in fact it was not. Heavy pressure faced by the operators on AOD contributed to their perceived slowness of the system. Various external and internal causes of the problems were identified by them but they came to the view that the breakdown of ST1 was mainly caused by two factors, namely, (i) the ramp confusion and the unfamiliarity or non-compliance of the procedures by RHOs; and (ii) the lack of flight information from the Flight Data Display System ("FDDS") or the Flight Display Data Feed Services ("FDDFS").

18.176 The Commissioners consider the opinion of HACTL's experts to be flawed. The alleged two main factors were in respect of fields not within their professed expertise. Further, rather than basing their opinions on the evidence already presented to the Commission, W52 Nimmo and W53 Day based their report on facts that they were told by HACTL staff but those facts were not supplied to the Commission and had not been tested before the Commission. It is therefore risky to rely on anything they expressed as their opinions unless it is clearly proved that their views are supported by the evidence presented to the Commission, and that such views are within their fields of expertise.

18.177 Despite the apparent deficiency in their opinion, the Commissioners had, as a matter of caution, examined W52 Nimmo and W53 Day's views on the factors that were said to have caused the breakdown of ST1 against reasonableness and the facts as found by Commission. Contrary to the view of HACTL's experts, the evidence shows that the ramp confusion and chaos on AOD were caused by, and not causing, the breakdown of CHS. As to the second main cause identified by the two experts, namely, the lack of correct and complete flight information from FDDS or FDDFS, this simply could not stand in the light of the evidence before the Commission. Another reason that was put forward was the late delivery of pre-manifests by airlines. The Commissioners take the view that even if this did occur, the impact could not have been that substantial as to become a major cause of the breakdown. It certainly would not have caused the slow response to CHS, which was the main cause for the HACTL's staff to go for manual operation which eventually led to ST1's breakdown.

18.178 Dust had been maintained by HACTL as one of the culprits for the breakdown of CHS on AOD. It was first presented as a major problem on 15 July when HACTL began to downplay the computer software problem. It was stressed as a major problem by almost all employees of HACTL who testified before the Commission, except the Managing Director, W7 Mr Anthony Crowley Charter. HACTL alleged that dust together with the presence of water at ST1 blocked and seriously affected the 15,000 highly sensitive sensors and reflectors installed for the operation of the mechatronics of CHS on Level 1, which was the most important element in the handling of cargo. The witnesses from HACTL, notably W11 Mr LEUNG Shi Min and W10 Mr HO Yiu Wing, who were working in ST1 on AOD told the Commission that a substantial cause of the problems with CHS on AOD was dust. However, from all the public statements made by HACTL up to 15 July 1998, that alleged substantial cause was not mentioned. The evidence of W9 Mr Gernot Werner of Demag and W16 Mr Hiroshi NAKAMURA, W17 Mr Tomonobu SAEKI and W18 Mr Shin YAMASHITA of Murata did not support the dust theory either.

18.179 On the contrary, their evidence suggested that the problem lay with the software of the LCS. Upon HACTL's instructions, on about 18 July 1998, Demag cut the link between PLC and LCS that enabled CSS to be operated on an off-line mode. Murata, on the other hand, had received three instructions from HACTL on 16, 18 and 21 July 1998 to modify the interface between LCS and PLC regarding BSS resulting in BSS going back to full operation since 13 August 1998.

18.180 When W2 Mr YEUNG Kwok Keung, the Deputy Managing Director of HACTL, gave evidence before the inquiry, he admitted that the trouble created by dust and contamination were appreciated by him as early as 21 April 1998 and that teams of engineers were deployed to deal with the cleaning of the mechatronics of CHS. If in fact dust was the culprit on AOD and was noticed by W11 Leung and four engineers, it would be inconceivable why the faults summaries regarding problems experienced by CHS on AOD and 7 July that were prepared by the Engineering Department a week or two afterwards hardly identified it. The Commissioners do not believe that dust did cause the amount of problems facing ST1 on AOD, which according to W11 Leung's evidence might be as much as 30% or 50% of the problems encountered by ST1 on AOD. Even W7 Charter stated that the dust problem was overplayed. The Commissioners also rejected the allegations of W2 Yeung and W11 Leung that the severity of the dust problem could not have been foreseen prior to AOD.

18.181 The Commissioners regret to say that much time and costs had been spent in this inquiry on "dust", which, towards the end of hearing HACTL's evidence, HACTL conceded to be not a major factor. When its two experts gave evidence, they said that this problem was manageable.

18.182 Various factors had been put forward by HACTL or its experts as being contributed to the chaos. These factors have been dealt with in Chapter 14 in this report. It is interesting to note that few of these problems could be said to be the responsibility of HACTL. When W12 Mr Johnnie WONG Tai Wah, W13 Mr Peter PANG Tai Hing, W14 Ms Violet CHAN Man Har and W15 Mr Daniel LAM Yuen Hi, all from

HACTL gave evidence in this inquiry, W15 Lam, Operations Computer Project Manager, said that he had tested the throughput of CSS but not the throughput of BSS. The test would be used for assessing how many units of cargo could be handled by CSS and BSS in one hour. He merely relied on the test that had been conducted by Murata notwithstanding that the latter was not an integrated test involving the higher levels.

18.183 Having considered the evidence, the Commissioners arrive at the conclusion that one of the major causes for the breakdown of ST1 was that CHS, especially BSS integrated with the higher levels, was not sufficiently tested before AOD due to the compression of the time required for testing and commissioning of such a sophisticated and complex cargo handling system. This was one of the major reasons why on AOD, BSS experienced a slow response in dealing with many cargo in live load operation. In a press release made by HACTL on 8 July 1998 announcing an extension of the 24-hour embargo for another 48 hours, it was stated that:

> "Since our announcement yesterday of temporary measures to relieve SuperTerminal 1 from the pressures it was under, we have now had time to more closely analyse problems…
>
> "… allowing our engineers and contractors adequate time to rectify current hardware and software problems with our Box Cargo Storage Systems."

18.184 Looking at the evidence, such as the work performed by Demag in de-linking PLC from LCS regarding CSS to enable CSS to operate in an off-line mode as well as Murata's work to the interface between LCS and PLC of BSS, the Commissioners find more probable than not that one of the main causes for ST1's paralysis was that there was something wrong either with the software of LCS or with the interfaces between LCS and CSS and between LCS and BSS.

18.185 Another main cause for the ST1's breakdown was the insufficient training and unfamiliarity of HACTL's operation staff with CHS, particularly the operators of CSS and BSS. This is mainly caused by the delays of the construction works. HACTL's experts, W52 Nimmo and W53 Day, effectively agreed to this. In support of their theory that there was perceived slowness of the system by the operators, the two experts stated that the operators working on the floor of ST1 were not well trained or familiar with operating CSS or BSS. Otherwise, the operators would have known that LCS would only commence a process of cargo movement until the entire route was clear and therefore would not have perceived the system to be slow. W52 Nimmo and W53 Day also attributed the high level of operators error in data entry of inventory record when the CHS was in manual mode to the lack of training and unfamiliarity of HACTL's operators.

18.186 W7 Charter, in his evidence, hinted that HACTL had been operating under pressure to make ST1 ready for handling cargo on AOD, which was decided without consulting it and despite the contractual completion date of 18 August 1998. HACTL also alleged that the 6 July date was cast in stone and was not moveable, even if HACTL were not ready. It also intimated that a soft opening was requested by it but rejected. The evidence however pointed to the contrary. After the announcement of AOD in January 1998, HACTL volunteered the information that it would be able to process a throughput of 75% on AOD instead of 50% as it had previously promised to achieve by April 1998. The feeling of pressure was also inconsistent with the assurances given by HACTL continuously right up to the beginning of July 1998 that ST1 would be ready for operation on AOD. The Commissioners are of the view that the root of the problem was not so much HACTL's belief that AOD could not be deferred or soft opening was absolutely unavailable. Rather, it was HACTL's over confidence with its brainchild, ie, the computer systems of CHS and with its ability to have ST1 ready by AOD that resulted in the chaos at ST1.

18.187 For the delay in the completion of the construction works, which resulted in delay in the installation of the CHS, the responsibility should lie between HACTL and Gammon Paul Y Joint Venture ("GPY"). Blames were put by one on the other for the delay. However, the time available in this inquiry does not permit the Commission to investigate into such complex construction disputes between HACTL and GPY.

18.188 Despite the change in HACTL's emphasis on the contamination problem, the Commissioners consider that it must have caused a small extent of interruption to CHS. Similar to problem of the delay in the construction and related works, which is closely related to the problem caused by contamination, the Commissioners are unable to reach a conclusion save as to say that either HACTL or GPY or both should be responsible for the contamination.

18.189 The Commissioners do not accept that the increase in the numbers of CTOs and RHOs at the new airport contributed to the paralysis of ST1 on AOD. On the confusion with the procedures in the handing over of cargo between HACTL and RHOs on AOD, the Commissioners opine that it was the problem of CHS itself that spilled over to affect the operations of RHOs. For this, RHOs should not be held responsible. There was a shortage of dollies for delivery of cargo on AOD. However, the Commissioners consider that this was an effect rather than a cause. The slow response of CHS led HACTL's operators to switch onto the manual mode which slowed down the whole process. As a result, the hand-over procedures for cargo can hardly be followed. It resulted in dollies being detained for much longer than the agreed turn-around time of 30 minutes. HACTL should be responsible for the shortage of dollies.

18.190 The Commissioners find that FDDS or Flight Display Data Feed Services ("FDDFS") not providing flight-related information to ST1 as expected or at all did, to a minor extent, cause trouble or inconvenience in the operation of cargo handling. For this, AA should be mainly responsible for failing to provide the necessary flight-related information through Airport Operational Database ("AODB") from which FDDS and FDDFS drew the information.

18.191 HACTL should also be responsible for the delay in the testing and commissioning of the machinery and HACTL's own systems and in the training of its staff for operating the machinery and systems. There was an error of judgment on HACTL's part that despite the shortage of time, all the machinery and systems would have been sufficiently tested and would face little problem when they were employed to work together in the actual operation on AOD.

18.192 HACTL's confidence in its computer system as its brainchild and the under-estimation of the significance of having the software tested thoroughly when integrated with BSS and CSS was manifested in HACTL not having any contingency plans for the failure of CHS. The Commissioners do not accept that HACTL had made any risk assessment or any real and workable contingency plan.

18.193 Having considered the evidence in this inquiry, and having examined the witnesses' testimonies, it is clear to the Commissioners as to the major causes of the chaos on Day One. On AOD, about 2,000 containers had been transferred from Kai Tak to ST1. In addition, cargo arriving from inbound flights started to accumulate. HACTL's operation staff began to notice slow response with both CSS and BSS due mainly to LCS not operating PLC and the mechatronics smoothly. The slow response of CHS led HACTL's operators to switch into the manual mode, instead of the pre-set automatic mode. Although this helped processing of the cargo, it was still much slower than the automatic process. As a result, the procedures of hand-over of cargo that had been agreed between HACTL and the RHOs could hardly be followed, and inbound cargo was left by the RHOs on dollies outside the airside at the northern part of ST1. The dollies were detained for much longer than the agreed turn-around time of 30 minutes, and as a result, there was a shortage and the RHOs placed the goods on the dollies onto the ground in order to retrieve the dollies for other inbound cargo. Unprocessed cargo started to build up outside ST1 during the course of AOD and the northern part of ST1 and the surrounding area was congested with an enormous number of cargo. The backlog of cargo, in turn, seriously hampered the processing of cargo. Insufficient training of the operators, particularly in the manual mode, resulted in human errors in not updating LCS or updating it incorrectly. This act or omission caused the inventory to be adulterated, so much so eventually that there had to be a physical check of the inventory. During the course of the physical check in the small hours of AOD, a utility programme was inadvertently switched on which erased the inventory. This gave rise to grave concern to HACTL as it had to find out the reason before there was any meaningful rebuilding of the inventory. At the same time, investigation had to be made as to why LCS was not operating as smoothly as expected. All these resulted in the 24-hour embargo announced on 7 July, which was effectively extended for 48 hours on 8 July and 9 days on 9 July, so that the cargo at ST1 could be cleared from CHS and moved to Kai Tak for processing. During the period of the embargo, the cargo was removed out of CSS and BSS, the equipment was cleaned, Demag was instructed to cut the link between LCS on the one hand and PLC and mechatronics of CSS on the other. Murata was instructed to do some improvement work on the LCS-BSS interface. Thereafter, CSS and BSS could be operated smoothly in an off-line or manual mode. In the meantime, HACTL was debugging or enhancing LCS and the software of the higher levels of CHS. HACTL announced a four-phase recovery programme on 16 July 1998, during which HACTL took the opportunity to test and commission its computer system. Cargo was processed at both Kai Tak and the new airport during recovery leading to the resumption of the full cargo handling process at ST1 on 24 August 1998.

18.194 Under the HACTL franchise, HACTL is not under obligation to provide any particular capacity by AOD for the contract only obliged HACTL to provide by 18 August 1998 a cargo handling throughput of 75% of the full ST1 capacity, ie, 5,000 tonnes of cargo a day. Whether it is a matter of goodwill or a gentlemen's agreement, HACTL promised to use its best endeavour to be ready by 75% capacity on AOD. The Commissioners have no trouble finding that HACTL did use its best efforts in the circumstances. However, the question was HACTL represented to AA and Government that ST1 would be ready to produce 75% of its throughput capacity on AOD. This representation was relied on by AA and Government whom might have been induced in doing so by the success and reputation of HACTL as the top CHO in the world. The events on AOD and the days after have proved the representation to be ill conceived and incorrect. Had HACTL maintained its contractual position that it would only be 75% ready on 18 August 1998 and not earlier, Government would never have made the decision to open the airport on 6 July 1998. A good example is the case of AR where MTRC represented to ADSCOM that AR would not be ready before the contractual date in June 1998. Government did not insist on AR opening before June and the date for opening the new airport was postponed from April to 6 July 1998 in January 1998.

18.195 The Commissioners conclude that HACTL is responsible for giving the false sense of security to AA and Government that it was ready to operate on AOD. It would not be fair for HACTL to cling to the contractual terms to say that it is not responsible for not being ready on AOD. Even though this responsibility arose out of goodwill and a mere gentlemen's agreement without any contractual liability, the Commissioners think that leading AA and in particular Government to reach the decision on AOD and not to alter that decision is culpable, and HACTL must fairly be held responsible for that area of the process of the decision-making and thereafter for either failing to render ST1 ready to deal with the expected tonnage of cargo on AOD as it had promised or failing to strive for a deferment of AOD or to seek a soft opening timeously.

18.196 To summarise, the Commissioners find, on the balance of probabilities, that the following parties are responsible for the breakdown of ST1 on AOD and in the period of about a month thereafter:

(a) HACTL is responsible for giving the assurances to AA and Government that ST1 would be ready to provide 75% of its throughput capacity on AOD.

(b) The main causes for the breakdown of ST1 were (i) the faults with CHS which resulted in the inefficiency of LCS in controlling and operating PLC and the mechatronics, (ii) the insufficient testing of CHS in fully integrated mode, and (iii) the insufficient training and unfamiliarity of HACTL's operation staff with operating CSS and BSS in manual mode; and for all these HACTL is solely responsible.

(c) Either HACTL or GPY or both are responsible for the delay in the construction works at ST1.

(d) Either HACTL or GPY or both are responsible for the delay caused to the installation of the machinery and systems at ST1 and in the testing and commissioning of such machinery and systems.

(e) HACTL knew of the delays in (c) and (d) above, and is responsible for under-estimating their effects on the readiness of ST1 to operate efficiently on AOD.

(f) Contamination of the environment on AOD was very minor, and would have posed little difficulty to HACTL in the operation of its CHS.

(g) Contamination of the environment, anyhow, was known to HACTL as early as late April 1998, and HACTL is responsible for not sufficiently clearing the environment for the proper and efficient operation of CHS.

(h) The circumstances of there being three RHOs and two CTOs were known to HACTL long before AOD, and the RHOs' involvement with cargo handling could hardly be described as an appreciable cause for the breakdown of HACTL.

(i) The ramp chaos and alleged insufficiency of dollies were consequences of the slow response of CHS in processing cargo and not the causes of the slow response.

(j) The failure of FDDS or FDDFS (for which AA and others are responsible) also would not have been a serious threat to the efficient operation of CHS, as HACTL could have used a few employees to obtain the necessary flight information.

(k) The late delivery of pre-manifests by airlines and the new Customs and Excise Department customs clearance procedures would cause some inconvenience to HACTL but did not contribute to the breakdown of ST1.

18.197 One other matter should be mentioned. Over 10 solid days had been spent in the hearing of the Commission for seeking facts and reasons relating to the question of dust, which had been raised as a major problem by HACTL for ST1's breakdown on AOD. Had dust been raised as a minor factor contributing to the breakdown, much less effort and time would have been spent.

18.198 To deal with the backlog of cargo that congested its terminal and the area outside the interface with the ramp, AAT made arrangements with the nearby Airport Freight Forwarding Centre ("AFFC") to use the latter for breakdown, storage and collection of the backlog cargo, which was cleared by 13 August 1998. Since the use of AFFC, the severe congestion at AAT's terminal started to abate.

18.199 HACTL's four-phase recovery programme was completed on 24 August 1998, and ST1 has appeared to have operated normally.

[42] Baggage Handling Chaos

18.200 The BHS is an important system at the new airport. It affects flight departures and the time in which arriving passengers can collect their baggage. As the baggage handling chaos on AOD and the few days afterwards show, problems with BHS can have a huge ramification that can affect the efficient operation of the new airport. The chaos had a direct and significant impact on passengers, arriving or departing, causing delays and inconvenience to them.

18.201 There was a serious problem in the handling of baggage on AOD. Some 6,000 to 10,000 of 20,000 departure and transfer bags processed on AOD missed their flights. Some departure bags were loaded onto flights late, adding to delays in flights departing. Departure baggage handling started getting unmanageable by about 9 am on AOD.

18.202 On the first week of AOD, arrival passengers experienced significant delays in reclaiming their baggage. From Days Three to Seven, arrival passengers had to wait for an average of 1 hour 41 minutes to collect their bags. There was also some confusion as to where bags were to be picked up. Passengers were inconvenienced and the standards previously achieved at Kai Tak were not met at the new airport until about the second week. The effect of the baggage handling problem was compounded by the other problems happening on that day, in particular, the FIDS problem. Flights were delayed, and there was confusion over stand and gate allocation and parking of planes. There were also problems in the allocation of reclaim carousels at the Baggage

Reclaim Hall ("BRH") and in the display of carousel numbers.

18.203 It is clear that the problems were caused by a number of separate and discrete matters, including human error. Some problems were the effect of other problems encountered in airport operations, eg, with FIDS and TMR. Each problem had a significant impact if not by itself, certainly when combined with the other problems encountered. In Chapters 12 and 15, the Commission has identified 19 factors leading to the chaos under [BHS 1] to [BHS 19]. Not one single factor, by itself, can be said to have caused the chaos. However, it is clear that baggage operation was seriously hampered by the large number of problem bags on Day One (about 30% of all the bags processed). There were also some 500 system stoppages on AOD, one even lasted for a few hours. Airline staff had to transfer bags from one conveyor belt to another. Stoppages in turn led to the accumulation of more late and problem baggage. As the problem bags became unmanageable, BHS started to die back up to the infeed points. Accordingly, system stoppages and problem baggage caused a vicious cycle which eventually led to extreme delays in baggage handling. Due to the problem of FIDS, the resources of the three RHOs were fully stretched which affected their ability to deal with all the problems that arose on AOD. There was a lack of familiarity of the staff of airlines, RHOs and Swire Engineering Services Limited ("SESL") with baggage handling procedures, with BHS and the working environment. Because of the sheer volume of problem bags and difficulties faced by RHOs, problem bags were not sorted and dealt with in time. Many of the departure and transfer bags missed their flights.

18.204 It is important not to lose sight of the fact that the inefficiency of FIDS on AOD drained heavily on the resources of RHOs in obtaining the necessary stand and time information, resulting in delay in their baggage handling activities. Had the necessary flight information been available, RHOs' resources could have planned and allocated their resources more efficiently which might have alleviated or even eliminated the baggage chaos.

18.205 The 19 problems that have been identified by the Commission in Chapters 12 and 15 and the parties responsible for them are set out below.

18.206 [BHS 1] Cathay Pacific Airways Limited ("Cathay Pacific") and Securair Limited ("Securair") staff fed about 220 bags from Kai Tak with no baggage labels into the conveyor system at the new airport. These bags were among some 420 interline bags that were brought to the new airport on AOD. These bags should be brought down to the Baggage Hall either by the out-of-gauge lift or by using the "fallback tags". As these bags were put into BHS without any baggage labels, BHS identified them as problem bags and rightly diverted them to the problem bag area. Whilst it was clear that these bags were injected into the system by Cathay Pacific and Securair staff, the Commission is not able to apportion the blame without the benefit of cross-examining the relevant witnesses.

18.207 [BHS 2] Airlines checked in bags with incorrect labels or invalid or no Baggage Source Messages ("BSMs"). BHS sorts departure and transfer baggage automatically to the correct laterals through the reading of the 10-digit bar-coded licence plate number on the baggage label printed by airlines and by looking up the corresponding BSM in the BHS Sort Allocation Computer ("SAC"). On AOD, some departure and a large percentage of transfer bags bore labels with bar codes that were not recognisable by BHS, or were given BSMs of an incorrect format. JAL and Thai Airways International Public Company Limited (Thai Airways) have respectively accepted that they were responsible for some 600 and seven of these bags. In another case, the wrong prefix (JL instead of EG) was programmed for recognition by SAC in BHS for the bags of Japan Asia Airways. BHS was therefore unable to recognise EG's bags which were sent to the problem bag areas. This problem was rectified within a few days after AOD. Other than JAL and Thai Airways, the Commissioners are unable to find out which were the offending airlines.

18.208 [BHS 3] Airlines checked in about 2,000 bags with invalid flight numbers. Some airlines entered flight numbers for baggage labels and BSMs that were different from those listed in the flight schedule, and were thus not recognisable by BHS. These bags therefore became problem bags. Other than Canadian Airlines International Limited and Virgin Atlantic Airways Limited who admitted responsibility for a very small portion of these bags, there is insufficient evidence for the Commissioners to identify other offending airlines.

18.209 [BHS 4] AVSECO staff rejected a large number of bags at Level 2 security screening, putting pressure on Level 3 screening, lengthening baggage handling time and causing more problem bags. The Commissioners find that this is a matter of familiarity and caution for AVSECO staff in security screening of bags. No one should be blamed as a more cautious approach should be preferred over any lesser standard which might create security risk.

18.210 [BHS 5] RHOs delivered transfer bags from inbound flights into BHS after connecting flight laterals had been closed. Whilst this was clearly the fault of RHOs concerned, the Commissioners find that this was due to the various difficulties faced by RHOs as a result of the lack of accurate flight information caused by FIDS failure. It is, however, not possible, from the evidence before the Commission, to identify the offending RHOs.

18.211 [BHS 6] RHOs did not clear bags from departure laterals in time, resulting in full lateral alarms, which caused subsequent bags to go to the problem bag area. This created about 600 problem bags for which RHOs should be responsible. Again, the Commissioners do not have sufficient evidence to hold any particular RHO responsible for this.

18.212 [BHS 7] One of RHOs, Ogden, put about 230 arrival bags from a KLM flight No.887 onto transfer laterals. Some delay and inconvenience were caused to the arriving passengers on that flight although most of them received their bags on the same day. This was an isolated incident caused by human error for which Ogden had accepted responsibility.

18.213 [BHS 8] Bags that could not be safely conveyed were not put in tubs and OOG bags were fed into the conveyor system instead of being sent down to the Baggage Hall via the OOG lift. Unconveyable bags such as soft bags that will roll along the conveyors and rucksacks with straps must be put in tubs before being injected into the system. Otherwise, the conveyors might be jammed and thus causing system stoppage. There were about 200 to 250 bag jams on AOD under this category which contributed to the baggage handling chaos. Whilst the Commissioners have little doubt that this did happen, the evidence does not show precisely which airlines should be held responsible.

18.214 [BHS 9] Too many erroneous emergency stops led to numerous disruption and system downtime. The emergency stop buttons were pressed some 99 times on AOD. The buttons might have been pressed deliberately, as when bags had to be manually removed from the system by SESL, RHOs or AVSECO. In other cases, it could have been activated for safety reason. The Commissioners find that the person or persons pressing the buttons, albeit causing system stoppage, should in the latter case, not be held responsible. The Commissioners are also of the view that the protruding design of the emergency button is not flawed as it should be easily accessible to the operators to facilitate activation immediately in case of danger. There is no evidence before the Commission of the identity of the persons who pressed the emergency buttons.

18.215 [BHS 10] Communication difficulties between operators in the Baggage Hall due to TMR overload and unavailability of other means of communication resulted in longer times for the system to be reset each time it was stopped. When part of the system stopped, Baggage Handling Operators ("BHOs") would be sent to the scene to investigate the cause and to rectify the problem. BHOs would then have to notify the BCR to restart that part of the system. However, due to the overloading of TMR, the operators were not able to communicate with BCR effectively. The communication difficulties exacerbated the problems caused by system stoppages because operators had difficulties communicating with each other and resets of the system which could have taken one to two minutes had taken 10 minutes instead. Responsibility for system stoppages has been dealt with above and the TMR problem is covered in under item [2] TMR in Chapter 16 in this report.

18.216 [BHS 11] RHOs had no reliable flight information from FIDS and had communication difficulties due to the overloading of TMR and mobile phones and unavailability of other fixed lines of communication. There were delays in collecting bags from aircraft and transferring them to the Baggage Hall by RHOs due to the snowball effect of delays on the apron caused by a number of factors. For example, stand allocation by ACC was delayed. The apron was full on AOD from about midday to 5 pm and from 8 pm to 1 pm and arriving aircraft had to queue up at the taxiway for the next available stand to be allocated. There was a lack of accurate flight information being disseminated to RHOs, which increased ground time for handling arriving passengers and baggage. Flight information was not displayed via FDDS. Coupled with the TMR and mobile phones problem, RHOs' operations were seriously hampered because they had difficulties knowing the time and at which stand the aircraft would park. These problems are dealt with in other parts of this chapter.

18.217 [BHS 12] RHOs did not use both feedlines of the reclaim carousels. An allegation was made against RHOs that they did not maximise the use of the feedlines of carousels as each arrival carousel could be fed by two conveyors. This increased despatch times and thus slowed down the baggage handling process. The Commissioners consider that the time which might have been saved in using both feedlines would be slight. This problem would have been negligible but for the other problems surfacing on AOD.

18.218 [BHS 13] RHOs did not know the assigned lateral for arrival bags. The usual practice is that reclaim laterals are assigned by SESL according to a pre-arranged allocation, which is distributed to RHOs and BHOs on a template the preceding night. However, on AOD, SESL reallocated laterals on a real time basis in order to optimise their use. The new lateral allocations were displayed for passengers in BRH. Unfortunately, RHOs did not receive the information as the FIDS LCD boards in the Baggage Hall were not working and there were inadequate back-up measures to relay the information to RHOs. While AA and SESL must be responsible for not having whiteboards or fallback signage made available at the Baggage Hall to direct RHOs to the proper areas and laterals, SESL might not reasonably expect a FIDS failure. It is therefore difficult to apportion the blame on the evidence. The Commissioners do not feel that the evidence is sufficient to hold that it was unreasonable or improper for SESL to disregard the template in the hope of facilitating better use of the laterals, in accordance with the actual flight times. The problem was apparently resolved when SESL was told by AA to revert to the original fixed schedule and stop real time reallocation at about 8 am on AOD. The crux of the problem was the deficient operation of FIDS.

18.219 [BHS 14] RHOs abandoned ULDs around arrival baggage feedlines, causing congestion and confusion in the Baggage Hall. The reason given by RHOs was that the problem bags were loaded in ULDs and since there was no baggage staging area, the only place available for the temporary storage of ULDs was the space around the arrival baggage feedlines. There is no evidence that any other place in the Baggage Hall was available to accommodate these ULDs. The Commissioners therefore accept that this was the effect whereas the insufficient contingency planning of AA was the cause.

18.220 [BHS 15] FIDS workstation in BCR performed slowly and hung frequently. On AOD, the FIDS workstation in BCR was recorded to have "hung up" at 10 am and frequently at other times. Evidence was given before the Commission that at times, it took 20 to 25 minutes to make one reclaim belt allocation. This resulted in either no or delayed displays of reclaim belts to RHOs and to passengers. At about 10 am the performance of the FIDS workstation in BCR was so slow that AA/EDS decided to reconfigure the parameters and the reclaim belt allocation was taken over by AOCC which had more workstations to switch around. This problem is dealt with in Chapter 13.

18.221 [BHS 16] There was no reliable flight information displayed on the LCD boards in BRH. This caused problem to passengers who did not know where to pick up their bags. The Commissioners accept the evidence of SESL which attributed the problem to slow and unstable performance of FIDS. The matter, concerning FIDS, is also discussed in Chapters 10 and 13. To fill in or supplement missing information, AA put whiteboards with necessary information written on them at BRH on Level 5 early in the morning on AOD.

18.222 [BHS 17] Stretching of RHOs resources. As described above, this was caused by the lack of essential information and other means of effective communications as well as the extraordinary number of the problem bags. For instance, runners had to go between AOCC's whiteboard and staff on passenger and cargo ramps to pass on information that should have been available from FDDS. RHOs had difficulties knowing where to send staff to pick up or to load baggage. The build up of problem bags meant that RHOs' manpower was severely stretched with manually sorting these bags. Additional manpower was deployed by RHOs to cope with the situation on AOD and by about Day Three, the situation had improved significantly and baggage operation began to normalise. Having considered the evidence, the Commissioners find it improbable that there would have been a manpower shortage with RHOs, had the problem bags not been of the unexpectedly large number on AOD. The drain on their manpower was caused by the inefficient operation of FIDS and the other many problems that occurred in a vicious cycle and a downward spiral on AOD. Accordingly, RHOs should not be criticised for not removing the problem bags in time.

18.223 [BHS 18] The Remote or Hot Transfer System, although available, was not used to handle transfer baggage with the result that all transfer baggage was handled only by the Central Transfer System in the Baggage Hall, which slowed down operations. The Commissioners take the view that the effect of this was minor and this might not have been noticed but for the other problems.

18.224 [BHS 19] Inexperience or unfamiliarity of airline, RHO and SESL staff. Many of the actions of airline, RHO and SESL staff demonstrated their inexperience or unfamiliarity with their operation at the new airport. For instance, the airlines' incorrect method of introducing unconveyable bags into the system. However, viewing the evidence as a whole, the Commissioners come to the view that it was more because of unfamiliarity rather than the lack of experience or training on the part of the airline, RHO and SESL staff that caused the problems with baggage handling on AOD, though undoubtedly more hands-on training would have resulted in more familiarity in operations.

Furthermore, the unfamiliarity might not have been so serious had AA planned and worked out with RHOs the required resources for coping with baggage handling in case of FIDS failure. AA should therefore be responsible for lack of sufficient coordination.

18.225 During the days after AOD, there was improvement to the performance of FIDS, and the direct and consequential problems it created gradually subsided. On Day Two, the number of bags left over was 6,000 out of a total of 24,000 bags processed. This was reduced to 2,000 (out of 26,000 bags), 1,400 (out of 27,000 bags) and 220 (out of 27,000 bags) on Day Three, Day Four and Day Five respectively. RHOs were able to return to normal operation by about Day Three to Day Four. RHOS, passenger handling entities and airlines had worked with AA to put more logic into the assignment of gates to minimise the amount of travelling time around ramps. Further, as staff and operators became more experienced and familiar with the system and operation, baggage handling at the new airport improved significantly.

18.226 AA's statistics showed that by Week 2 of AOD, the average figures for first and last bag delivery times were similar to figures for Kai Tak, and were improving. The latest statistics published by AA show that during the period from 1 December 1998 to 3 January 1999, for 90% of the flights, the first and last bag delivery times were 19 minutes and 36 minutes respectively, which far surpass the figures of 25 and 43 minutes for Kai Tak. In the week commencing 31 August 1998, only 296 bags out of a total of 228,000 departure and transfer bags processed missed their flight. As at today, the baggage handling process can certainly be said to have attained the world-class standard.

Section 4 : Adequacy of Communication and Coordination

18.227 There is no evidence received by the Commissioners to justify a finding that there was any lack of coordination or communication between ADSCOM and NAPCO in relation to ADSCOM's decision to open the airport on 6 July 1998 or in NAPCO's overall monitoring of AOR issues.

18.228 W36 Mrs Anson CHAN, the Chief Secretary for Administration and the Chairman of ADSCOM ("the Chief Secretary") said in evidence that NAPCO's monitoring role was that of a critical observer which the Commissioners accept. The role of the critical observer is to critically examine and evaluate the progress of various AOR critical issues through AA's reports, as well as through observation by NAPCO's own professional staff. The Commissioners opine that NAPCO failed in two aspects in the performance of its function. First, it should have inquired with AA whether it had the necessary expertise in monitoring HACTL's progress relating to the installation, testing and commissioning of ST1's 5-level CHS equipment and systems, but it did not do so. Secondly, it should have checked whether AA had plans and contingency measures and should have had an overall assessment whether such plans and measures were adequate in view of the then prevailing circumstances. As a corollary, NAPCO should also examine if AA had an overall risk assessment.

18.229 The evidence shows that ADSCOM had the duty of an overall monitor and it had delegated the duty of the overall monitor of the progress of AOR to its executive arm, NAPCO, and directed it to discharge the duty. The public looks upon ADSCOM, as opposed to NAPCO, to discharge the duty as the overall monitor. On this premises, ADSCOM is ultimately responsible for that duty not having been satisfactorily discharged by NAPCO.

18.230 There was difficulty in Government obtaining information from AA which showed a lack of cooperation. From mid-1996 onward, AA became more open to Government. It shared its internal reports with NAPCO and allowed NAPCO to take part in system tests. Towards AOD, coordination and cooperation between AA and NAPCO improved significantly that NAPCO was no longer complaining.

18.231 AA's business includes the operation of the new airport. In conducting such operation, it shall have regard to the safe and efficient movement of air passengers and air cargo. The problems encountered on AOD revealed that AA did not have sufficient regard in these respects when opening the airport for operation on 6 July 1998. AA should therefore be responsible.

18.232 Coordination and cooperation between AMD and PD was particularly important from about the last quarter of 1997 since the new airport was in a transition from the construction stage to the operation stage. The coordination between AMD and PD continued to cause concern up to mid-1998. The coordination problem is caused by several factors, namely:

(a) Less importance being placed on operational requirements as compared with the works programme.

(b) PD was the major part of the AA organisation up to AOD representing about three-fourths of the total organisation whereas AMD did not really start to grow and expand until the later part of 1997.

(c) W3 Townsend's engineering background leads him to place more emphases on the works side and to complete the project on time and within budget. Airport management was not W3 Townsend's specialty, and he might have tended to overlook this aspect.

(d) W43 Mr Douglas Edwin Oakervee, an assertive and imposing character, greatly influenced W3 Townsend, relatively milder in personality, in placing too much significance and priority on PD and giving less support to AMD. W44 Heed, a less resolute personality, took whatever was on offer, well knowing that he would be facing great difficulties when operating the new airport after the systems were handed over to AMD from PD with the degree of testing and commissioning leaving much to be desired.

18.233 A consultant report dated October 1997, commissioned for the purpose of advice on management structure post-AOD, revealed deficiencies in the leadership and teamwork of the senior management and incompetence of some senior managers. It is unfortunate that such important deficiencies were exposed at such a late stage. At that time, barely about six months before the AA Board's target date of April 1998 for airport opening, it would be too risky to introduce a change of the senior management. The Commission accepts this as a reasonable explanation and does not attach any blame to the AA Board. The Board however introduced measures recommended in the report to strengthen leadership and improve coordination, such as asking Government to second the then Director of NAPCO, W48 Mr Billy LAM Chung Lun, to be the Deputy CEO.

18.234 Notable examples of lack of coordination among Divisions within AA include:

(a) W44 Heed did not know that the 98.7% availability of FIDS reported to him at the meeting of AMD general managers in June 1998 only related to availability of host servers, and not the whole FIDS.

(b) W44 Heed was not informed that the stress and load test of FIDS was agreed between PD and GEC to be deferred after AOD, nor was he advised about the risks of not having the stress and load test conducted before the system was put into use.

(c) Neither W44 Heed, Director of AMD, nor W45 Mr Kironmoy Chatterjee, Head of IT, made satisfactory arrangements for experts of EDS and Preston to be stationed on AOD in the crucial ACC where it turned out that operators did experience difficulties in performing flight swapping with TMS and with input into FIDS.

18.235 The major causes of the problems within AA can be summarised as follows:

(a) Problems with personalities of the top management of AA.

(b) Late involvement of AMD and IT Department in the system development. AMD's requirements were not given high priority until sometime in 1997 whereas IT Department, which used to be part of the Commercial Division, only became involved from late 1996.

(c) There was no planning to ensure a smooth transition from the construction stage to the operational phase and no experts or consultants had been engaged for that purpose. Such experts might have helped in identifying the issues that needed to be resolved and measures that needed to be implemented for a smooth transition.

(d) Insufficient examination of the negative aspects of the interaction of the failures of more than a single system, resulting in a lack of overall risk assessment. This lack of overall risk assessment is especially unfortunate in view of the history of unreliability of FIDS.

(e) AA's failure to engage a consultant to monitor HACTL's systems. Had such consultant been appointed to monitor HACTL's testing and commissioning of its systems, it would not only have assisted AA in ensuring itself that HACTL was ready, but would certainly have helped HACTL to re-examine its assurances of readiness on AOD more carefully.

Section 5 : Responsibility of AA

18.236 The Commission finds that the AA management failed to maintain a right balance between PD and AMD in two ways. First, AMD's participation in project and systems development was not provided for in an early stage. Secondly, the personalities of the persons occupying key posts caused problems. This was discussed under section 4 above.

18.237 For the purpose of the inquiry, the acts and omissions and therefore the responsibilities of the following persons in the top AA management have been examined in detail:

(a) W3 Townsend

18.238 From the totality of the evidence presented to the Commission, it is clear that W3 Townsend was not in control of the management, resulting in lack of coordination between the PD and AMD. He did not give sufficient priority and adequate support to operational requirements of AMD, especially since the end of 1997 when more preponderance should have been accorded to AMD in the transition from the project stage to operation sphere. He did not assign sufficient resources to AMD at an early stage, and failed to give sufficient support to W44 Heed. He did not engage an expert to monitor HACTL's system. All these resulted in the deficiencies in the operational readiness of the airport. He must be responsible for failing to have any or any proper global assessment of AOR. He is further responsible for the misstatements he made to the AA Board and ADSCOM referred to below.

(b) W48 Lam

18.239 W48 Lam has been found by the Commission not to be responsible for the problems witnessed on AOD, or for the lack of communication and coordination or for the misstatements.

(c) W43 Oakervee

18.240 There is no evidence that W43 Oakervee has failed in his duties as Director of PD, although he should be primarily responsible for the slippages in respect of the construction and systems works vis-à-vis AMD which caused the time necessary for training and familiarisation of AMD operators on the systems to have been compressed.

(d) W44 Heed

18.241 W44 Heed, as the Director of AMD, must take the major share of blame of the problems and shortcomings witnessed on AOD. First, his personality was too weak. He ought to have stood firm vis-à-vis PD, in particular his counterpart W43 Oakervee, to ensure that AMD would have sufficient time to be properly prepared for AOD. Secondly, he failed in his duty to ensure that he was kept properly informed of the progress of the FIDS development so as to enable him, as head of AMD, to make an informed assessment as to the readiness of FIDS for AOD. Thirdly, he failed to ensure that an appropriate overall risk assessment was carried out to assess the risks involved in proceeding with the opening and the sufficiency of the contingency measures that were in place. He admitted that there was no global contingency plan. W44 Heed's weakness and deficiencies deprived Hong Kong of the chance of a smoother and more efficient airport on AOD.

18.242 He was not involved with either of the misstatements made by W3 Townsend referred to below. However, in his response to questions asked about the misstatement on ACS, his attitude was exposed. The matter is dealt with below.

(e) W45 Chatterjee

18.243 The Commission finds that W45 Chatterjee, as Head of IT, had failed in his duties in two respects. First, he did not assess properly the risks involved in deferring the stress test for FIDS. Secondly, he did not advise AMD properly of the risks involved in not undergoing such test before AOD. He was also grossly negligent in allowing the misstatement contained in the ADSCOM Paper about the reliability of FIDS unexplained at the ADSCOM meeting when the Paper was discussed. The matter is dealt with below.

(f) AA Board

18.244 The AA Board is ultimately responsible for the problems which occurred on AOD because the duty for developing and operating the new airport is placed on it by Section 4 of the Airport Authority Ordinance which provides:

> "Subject to the provisions of this Ordinance, the affairs of the Authority shall be under the care and management of a board whose functions shall comprise such care and management."

The responsibility to discharge the functions of developing and operating the new airport remains with the AA Board, although it is allowed by Sections 9 and 15 of the Ordinance to delegate its functions to a CEO and management.

18.245 The Commissioners do not accept the arguments that the AA Board should be responsible for W3 Townsend's acts and omissions or the acts and omissions of the AA management, nor that the Board should be professionally qualified. However, the Board may be criticised for not having appointed outside consultants to advise itself on the progress of important projects such as FIDS, instead of allowing AA management to have such consultants. However, this view may be derived from the wisdom of hindsight, which might have not been clear to the AA Board at the material time. This failure of the AA Board should not therefore be overstated.

Misstatements and Responsibility for Them

18.246 Two misstatements were identified during the inquiry. One was the reliability of FIDS as a whole was 98.7% available and the other was that ACS had been tested successfully. Although these misstatements are not related to any direct cause for the chaos on AOD, they had significant bearing on the top management of AA. They might also have created a false sense of security in ADSCOM.

18.247 On FIDS, the representation made by AA to ADSCOM in ADSCOM Paper 34/98 dated 23/6/1998 for the ADSCOM meeting on 24 June 1998 has the following passage-

> "Reliability tests on the present version of FIDS (Version 2.01C) commenced on 14 June and were completed on 20 June using live data from Kai Tak through the AODB. The reliability of the system as a whole has been 98.7% available; the reasons for unavailability of some monitors and LCD boards at the 24 June trial have been identified and the problems are being rectified."

18.248 A similar, but not identical statement, was found in an AA Board paper 183/98 dated also 23/6/98.

18.249 Both W45 Chatterjee and W43 Oakervee admitted that the passage conveyed false ideas, while W44 Heed did not have sufficient technical know-how as to comment. The truth of the matter is as follows:

(a) The 98.7% was the availability of the host servers, a hardware and not a software, and not any other part of FIDS, let alone FIDS as a whole;

(b) There is a slight difference between availability which means the time when a system is operational as opposed to downtime, and reliability which relates to the soundness and consistency of the system; and

(c) The mentioning of the unavailability of some monitors and LCD boards implied that the only problem with FIDS causing the achievement of reliability of 98.7%, as opposed to 100%, was the monitors and LCD boards, and this implication was false.

18.250 These false ideas did mislead ADSCOM, for its members all understood that the 98.7% referred to the reliability of FIDS as a whole system. However, because of the prior knowledge of ADSCOM members about the continual unreliability or instability of FIDS during the various tests up to that date, they placed greater reliance on the standby FIDS that had been reported to have been successfully tested on 30 June 1998 in case of a failure of the main FIDS. The false ideas therefore had not, in the Commissioners' opinion, caused too much mischief.

18.251 After examining all the evidence, the Commissioners are satisfied on a balance of probabilities that the finalised versions of the ADSCOM paper and the AA Board paper were made by W3 Townsend, and he must be personally responsible for uttering the misstatement to the AA Board and ADSCOM, although the evidence is not weighty enough for an inference to be drawn that there was clearly an intent on W3 Townsend's part to mislead ADSCOM.

18.252 W45 Chatterjee is also found by the Commission to have been grossly negligent in not pointing out the misstatement to ADSCOM or disabuse ADSCOM members when he attended two ADSCOM meetings subsequent to the provision of the paper to ADSCOM.

18.253 At the ADSCOM meeting on 6 June 1998, W3 Townsend, W44 Heed and W45 Chatterjee attended. The notes recorded that

> "CEO/AA (ie, W3 Townsend) added that the four key safety and security systems – access control, fire alarm, closed circuit television and PA had also been successfully tested. They were at the moment busily engaged in issuing access cards."

18.254 The fact, however, is that at the time of the ADSCOM meeting in question, problems regarding ACS had not yet been fixed and indeed, up to the day when the four senior officers of AA gave evidence together before the Commission, ACS problem had not yet been fully rectified. The statement of W3 Townsend to the ADSCOM meeting on 6 June quoted above is obviously incorrect. W3 Townsend denied having an intent to give false information. W44 Heed said he merely let the matter pass, not having a private word with W3 Townsend, nor did he think it necessary to do so for W3 Townsend should have known the situation. He admitted that it did not matter if members of ADSCOM was misled.

18.255 The Commissioners have not been able to find sufficiently weighty evidence to sustain a finding of wilful intent on W3 Townsend's part to mislead ADSCOM about the progress of ACS. Nevertheless, W3 Townsend must be the main culprit in making the misstatement to ADSCOM.

18.256 As far as W44 Heed is concerned, it transpired that he had not actually joined the meeting at the juncture when the misleading statement was uttered. However, he revealed his attitude on the matter merely being in support of the CEO, W3 Townsend and as a respondent to questions when put, but would not bother if ADSCOM was misled. The Commissioners find this attitude reproachable, especially in view of the trust reposed in him by ADSCOM by inviting him to attend its meetings. The attitude makes it doubtful whether he could properly handle matters in a crisis or delicate situation.

<u>Section 6 : The Present Situation</u>

18.257 The new airport has experienced and undergone a host of operational and management problems during its initial period of operation. However, looking at the evidence received by the Commission and excluding problems not yet surfaced (which are outside the Commission's work), it can be said that the new airport has completely come out of the pit of problems to attain the standard of a world-class airport.

18.258 There have been remarkable improvements to the operation of the new airport. This is illustrated in the following comparison of some of the operational statistics between Kai Tak and the new airport, as provided by AA.

	Kai Tak	New Airport	
Period	26 October 1997 to 27 March 1998	6 July 1998 to 31 July 1998	1 December 1998 to 3 January 1999
Average delay for incoming flights (excluding early & on-time flights)	30 minutes	30 minutes	24 minutes
Average delay for all outgoing flights	24 minutes	30 minutes	18 minutes
Time of arrival of first bag in baggage hall after aircraft landing - Average - time for 90% of flights first bag to arrive	25 minutes (service pledge)	25 minutes 40 minutes	13 minutes 19 minutes
Time of arrival of last bag in baggage hall after aircraft landing - average - time for 90% of flights last bag to arrive	43 minutes (service pledge)	39 minutes 60 minutes	25 minutes 36 minutes

The figures represent a very high standard of service which compare favourably with those for the Kai Tak airport. A brief summary of some airport operational statistics can be found at **Appendix XVI** to this report.

18.259 A more efficient operation of FIDS has enhanced the operation of other facilities at the airport, such as the operation of RHOs. RHOs have achieved 100% on-time docking of airbridges for arriving flights, allowing door opening within 2 minutes. Frontal stands which connect to PTB via airbridges are now being assigned to about 85% of passenger flights. Stands are allocated 2 hours before scheduled arrival times so that airlines, RHOs and other operators have sufficient time to plan their operation and to allocate their resources. The 68 aircraft parking aids on the apron have been comprehensively improved and other than a single incident on 15 July 1998 involving the parking of a Cathay Pacific aircraft that is dealt with above, 25,000 aircraft have conducted parking safely using the automated system of APAs.

18.260 Cargo operation has normalised. A working group has been established to resolve operational and communication issues. An interface agreement has been reached by the cargo terminal operators and RHOs on their respective roles and responsibilities, freighter handling procedures, the exchange and utilisation of equipment, the establishment of a cargo interface area and the procedure in using it and the establishment of times for cargo movements to and from aircraft and the cargo complex.

18.261 Since AOD, AA has improved the signage in PTB by adding 300 directional signs and 2,000 information signs. Incidents where people had to climb up the steep staircase due to escalators breakdown have been minimised. Improvement work has been carried out on the bus and taxi stations for the convenience of the public. Lighting, ventilation and cleanliness of toilets have also been improved. On airside, attendants have been put in place on the platforms for the APM to prevent people from boarding train at the terminal station where everyone should alight and to minimise human intervention in trying to pry open train door while it is closing. Security appears to be satisfactory and there was no recent report of major security breach. The overall security at the new airport has in fact been regarded as excellent by the Federal Aviation Administration, the United States government's aviation safety regulatory body.

18.262 The Commissioners are encouraged to hear that the new airport has recently won the annual Critics' Choice award of an American premier travel industry publication which commended the new airport's fast baggage delivery times, the high speed rail link and the attractive PTB. The new airport has also been selected as one of the top 10 Construction Achievements of the 20th Century by the major CONEXPO-CON/AGG Exposition to be held in March 1999 in the United States.

Section 7 : Could the Chaos and Confusion have been Avoided?

18.263 The most likely question to be asked after the opening of the airport and the conclusion of the inquiry seems to be: Could the chaos and confusion on AOD have been avoided? There are two most apparent alternative approaches to provide the answer, namely, (a) could anything have been done to prevent the chaos by way of better planning and working before AOD? or (b) should AOD be deferred and if so, for how long the deferment should be?

18.264 W51 Yuen, a consultant of the San Francisco International Airport, said that the risks of not having an efficient and smooth opening would only become more apparent when AOD was closely approaching. The Commissioners agree to this view in that even though a number of testing of the systems required for AOD could have exposed problems in operating the systems from time to time, ways and means would be considered and implemented to resolve the problems whenever they occurred rather than treating them as endangering AOD until at a late stage. When the problems persisted, AMD should have a comprehensive risk assessment, and implement measures that were considered necessary in the event of the failure of all the systems in PTB. A comprehensive risk assessment would have identified that in the case of failure of FIDS, the various means of communication for the dissemination of flight information would need to be ensured or their capacities increased. Contingency plans consequent upon such an assessment would have been developed by AA in conjunction with all other necessary airport operators, like the airlines, RHOs, BHO, line providers and CTOs. If all these had been done, then the chaos in PTB could have been alleviated if not eliminated altogether. Moreover, regarding ST1, if there had been effective monitoring by AA of the readiness of HACTL's CHS, HACTL might have been warned against its over-confidence. There might have been more testing of its systems and their operation in an integrated manner. If the airport trials had been prepared in such a way as to be much closer to a live situation of operation and participated by HACTL, it would have also helped expose problems in CHS. There are, however, grave doubts whether there would have been sufficient time to do all these things when the risks of not having a smooth and efficient operation became apparent.

18.265 All involved, those in AA, HACTL and other airport operators were working extremely hard to achieve the target, and there is no doubt about it throughout the evidence, oral and documentary, and at least they had been putting in everything they could since the end of 1997, if not earlier. It is because of this drive and spirit to focus on attaining the goal rather than taking a negative attitude of the task being unachievable that pushed everyone involved to exert himself or herself up to the limit. And it is this kind of drive and spirit that kept everybody from translating difficulties experienced in the early stages after the announcement of AOD into discouragement or warning that AOD could not be met. When time was getting closer, when problems with regard to a number of systems in PTB, notably FIDS, ACS, PA and telephones persisted, it would realistically be the first time that they should consider whether the risks justified a reconsideration of AOD. That would be too late for all the required risk assessment to be made or contingency measures to be planned and fully coordinated. That would only leave those involved with a Hobson's choice: to defer AOD.

18.266 While a postponement of AOD would prevent the chaos and confusion, it must be understood that it would not have helped if AOD, when it was announced in January 1998, was not 6 July 1998 but sometime later. The reason is that the risks affecting a smooth AOD would only have surfaced close to AOD. Had a later AOD been announced right from January 1998, the added time would not have exposed the risks at an early stage. W51 Yuen suggested that serious consideration of a deferment should have happened about two weeks before AOD. The Commissioners accept this view because it was at this juncture that the risks could properly and reasonably have been realised. W51 Yuen said that in hindsight, seeing that most of the problems were resolved satisfactorily within about two weeks after AOD, but taking account that if there was a deferment of AOD there would be a loss of momentum, the safe guide would be to triplicate the time needed for resolving the main difficulties, which would mean a postponement of six weeks. However, this estimate does not take into consideration HACTL's problems and that there could not be any actual live operation barring a real opening due to the fact that no simulated trial could create situations identical or as useful as live operation. W55 Dr Ulrich Kipper and W56 Professor Vincent Yun SHEN opined that two to three more months would be required to make FIDS run efficiently and four to six months would be needed to make ST1's operation smooth, taking into account the inevitable loss of momentum when a deferment was announced. The Commissions think that the experts' estimates were too conservative, and did not take sufficient account of the hefty financial implications and the effect of a further loss of momentum that a long postponement would produce. With the full benefit of hindsight and having examined all the evidence, the Commissioners feel that if a deferment were sought and considered about a fortnight before 6 July 1998, airport operation commencement should be deferred for about two months. The Commissioners recognise that momentum would certainly be impacted by a deferment, and HACTL's confidence of the readiness of its CHS would still be there. However, if AA and HACTL were impressed with the importance of making everything ready by the deferred date, the loss of momentum could well be reduced. Further, HACTL would then have its contractual deadline of 18 August 1998 to keep, while AA would know that its previous promised readiness target of April 1998 had been allowed to slip further. The added time would certainly be used by HACTL to have further testing done with CHS, allowing its staff to be better trained and getting more familiar with how to operate CHS, and having a better contingency planning with the implementation of contingency measures. On PTB side, the added time would be employed for a more widespread and intensive trial, say about six weeks before the deferred AOD, leaving sufficient time to eradicate the problems exposed by the trial. With more time, FIDS could have gone through a stress test and the means of communication could have been better prepared.

Section 8 : Lessons Learned

18.267 Although the Commissioners are not tasked to make recommendations as to how to address the problems encountered on AOD or oblivious of the expectation that no further airport will be built in Hong Kong in decades, they think that something would be amiss if they did not state their views as to what lessons they have learned from what has been revealed through the heavy work that they and all persons involved in the inquiry have gone through.

18.268 From the top, there is ADSCOM with NAPCO as its executive arm. Government was rightly concerned with the development and opening of the new airport, not only as the major shareholder of the statutory corporation of AA from a financial perspective, but also for the public good to ensure that public funds were spent in a worthwhile manner and to maintain Hong Kong as an international and regional hub of civil aviation as well as Hong Kong's reputation of high efficiency. ADSCOM took upon itself the task of deciding AOD, for all the above good reasons and because of its involvement in the other nine huge infrastructure projects of Airport Core Programme ("ACP"). It was therefore proper for ADSCOM to have an overview of AA's progress and performance. NAPCO was tasked with coordinating all the 10 ACP projects, and also monitoring the progress AA's work relating to AOR. This monitoring role is nebulous because, at times as W36 the Chief Secretary pointed out, NAPCO was a critical observer, but when problems were noticed with FIDS NAPCO adopted a more proactive attitude in getting more information than a critical observer would. This was perfectly fine for all concerned save that it would unwittingly lay a trap for AA whose Chairman and Vice-Chairman, ie, W50 Mr WONG Po Yan and W49 Mr LO Chung Hing, thought, albeit perhaps unjustifiably, that AA could rely on NAPCO's monitoring. This had unintentionally given AA a sense of security which should have been avoided, either by reminding AA of its statutory functions and obligations, or by telling it in no uncertain terms that NAPCO was purely working for ADSCOM. The involvement of an organisation like NAPCO could also have conjured up a false idea in the public that Government was to ensure that the work for which AA was solely responsible would be satisfactorily performed. In other words, getting more involved than its position required in a project which is the sole responsibility of a statutory corporation might give rise to a misunderstanding that the success or otherwise of the project is a Government responsibility.

18.269 While intervening more than NAPCO should in its overall monitoring of FIDS, its role regarding HACTL's systems is viewed by way of comparison. NAPCO is criticised for failing to inquire if AA had the required expertise in monitoring HACTL's systems. As a critical observer, NAPCO had, according to the Commissioners' opinion, failed to satisfy itself that AA had such necessary expertise. Its reliance on HACTL's good reputation and past record is not a reasonable excuse and its assumption that AA had the expertise was not proper, for the assumption could have been clarified with simply a question or a letter. If NAPCO, and in particular AA, were correct in relying on HACTL's high repute in the cargo handling field, there would have been no necessity whatever to monitor HACTL's progress, which was part and parcel of AA's statutory duties to have regard to provide efficient cargo movement at the new airport.

18.270 Within AA itself, the main lessons that have been learned are three-fold. First, whatever the organisational structure of a company, the most important aspect is the fitness of the personality and character of the persons occupying key posts, which must be viewed not only whether the persons fit the posts alone, but the interaction of the personalities of those occupying such posts should be considered carefully. W3 Townsend might have been fine if he had been given the position of Director of PD. This does not mean that he would have done a better job than W43 Oakervee in that post, but he would not be required to strike a proper balance between the requirements of progress or lack of it of the works and those of the operation side. On the other hand, W44 Heed as Director of AMD was too weak and irresolute a character to work alongside W43 Oakervee in getting what was required for operating the new airport. His position differs from that of a director of airport management in another airport because the situation of CLK in transition from a construction phase to an operational sphere seldom happens elsewhere. There seems to be nothing wrong with W43 Oakervee discharging his functions as Director of PD, but while his personality ensured that the requirements of his Division received top priority, it overbore on W44 Heed who strove with whatever was offered but did not seek, let alone find, substantially what he wanted from either W43 Oakervee or W3 Townsend.

18.271 Secondly, for a large project or in a large organisation, the eventual user should be given an early, if not a first, opportunity to work with the provider of the services. Had AMD and IT Department been involved in the planning stage of the projects, and the development of the systems in particular, there would certainly have been less changes to the systems because of the late notice of the operational requirements.

18.272 Thirdly, there should always be a global and comprehensive risk assessment, especially when various risky factors occurred incessantly during the development process. Most members of the senior management of AA knew that there was a risk in FIDS failing. What they had done was to have a contingency plan for that scenario. The contingency plan was merely to cover the situation when FIDS failed to display and distribute information to airport users, but not when such required information was inaccurate or incomplete. The scenario envisaged was not bad enough, or at least not as bad as that experienced on AOD. The only substantial contingency was to commission a standby FIDS which was however tested very late in the day on 30 June 1998. There was simply no assessment of how to react to a case if both of the systems could not function on AOD. There was no overall planning for the effective and efficient dissemination of the flight information needed by so many airport operators, and there was no concrete agreement as to what each involved party should do in the case of failure of both FIDS and standby FIDS. The availability and capacities of the means of communication were never considered in this light. HACTL fell into the same error and only relied on the modular nature of its systems and equipment as a full fallback position, which would only have been available if parts of the mechatronics, as opposed to software of its computer system, failed.

18.273 Connected with the lack of global risk assessment and preparation for the worst is the over-confidence of the key players, namely, AA and HACTL. The personnel of both organisations were working extremely hard towards achieving the goal on the target date. AA's top management were concentrating on what they could achieve within time and budget but unable or unprepared for sparing a little time to step outside their bounds to look at what they could not possibly achieve as a critical outsider. On the other hand, HACTL was focusing on developing its own intellectual protégé and was imbued with its hitherto success and reputation in running the cargo handling service in Kai Tak. HACTL's senior and junior management found it hard to believe that when every physical aspect of the works required for AOD had been completed there could be something wrong with the integrated use of CHS. Both of these groups of people in AA and HACTL had tried so hard and been so immersed in their work that they had failed to provide for the worst scenario. The over-confidence that had resulted in AA not seeking any deferment of AOD had similarly caused HACTL to reiterate the assurance of its readiness instead of even considering at a late stage to retract it or asking for a soft opening by retaining resort to Kai Tak, which it eventually did but only after AOD.

18.274 Delay with a deadline is always risky. The benefit of a deadline is that it will bring pressure to bear on people involved to use their best efforts and keep up the momentum. However, the pressure might cause the people to suffer a breakdown, or worse still might lull them into a false sense of confidence or even achievement, when they tell themselves that they have already done their best and everything is fine or everything else is a matter for luck or Providence. The accomplishment of the task might be at risk, for those who imbued themselves with the false sense of confidence and achievement would not be able to tell the faults in their own work. To prevent this from happening, it is necessary for those who are required to accomplish by a deadline to have a conscientious risk assessment of the situation and make comprehensive contingency plans to cater for various eventualities when delay is experienced.

18.275 On a more positive note, it is heart-warming that most people involved in the chaos and confusion on AOD drew themselves together in a most cooperative and congenial manner to help solve problems. The RHOs are an example, because they pulled their forces together in dealing with the problems with baggage handling and clearing the huge backlog of problem bags by employing the utmost of their resources. The witnesses told the Commission that many of them and others were working very hard, each to resolve the problems that he or she could help to resolve. Most if not all of them stayed overnight on AOD and some even several nights after AOD to contribute their share in the joint efforts. No one was thinking as to who should be responsible or who should properly be doing what. This applies to the many members of the airport community as well as civil servants. The Commissioners are deeply touched by the attitude and spirit that surfaced at the time of adversity, which they fervently hope will be infectious and available to help maintaining Hong Kong as a successful and happy community!

PARTIES IN THE INQUIRY
參加研訊的人士

Public Hearing of Evidence from 7 September 1998 up to 31 December 1998
由一九九八年九月七日至十二月三十一日爲止的公開聆訊

Parties

參加研訊的人士

Airport Authority

機場管理局

Asia Airfreight Terminal Company Limited

亞洲空運中心有限公司

AEH Joint Venture

AEH 聯營公司

Airlines Operators' Committee

香港國際機場航空公司委員會

British-Chinese-Japanese Joint Venture

British-Chinese-Japanese 聯營公司

Board of Airline Representatives

航空公司代表協會

Cathay Pacific Airways Limited

國泰航空公司

Electronic Data Systems Limited

Gammon-Paul Y. Joint Venture

金門保華聯營公司

G.E.C. (Hong Kong) Ltd.

英國通用電器香港有限公司

Hong Kong Air Cargo Terminals Limited

香港空運貨站有限公司

Hong Kong Airport Services Limited

香港新機場地勤服務有限公司

Hong Kong Dragon Airlines Limited

港龍航空有限公司

Hong Kong Special Administrative Region Government

香港特別行政區政府

[The major government departments and bodies concerned with the new airport are:

與新機場有關的主要政府部門和機構爲：

Airport Development Steering Committee

機場發展策劃委員會

New Airport Projects Co-ordination Office

新機場工程統籌署

Economic Services Bureau

經濟局

Civil Aviation Department

民航處

Airport Consultative Committee

機場諮詢委員會]

Hong Kong Telecom CSL Limited

香港電訊有限公司

Hutchison Telecommunications (Hong Kong) Limited

和記電訊有限公司

Jardine Air Terminal Services Limited

怡中機場地勤服務有限公司

Mass Transit Railway Corporation

香港地下鐵路有限公司

Ogden Aviation (Hong Kong) Limited

奧格登航空服務(香港)有限公司

Ove Arup & Partners Hong Kong Ltd

奧雅納工程顧問香港有限公司

Swire Engineering Services Ltd

太古機電有限公司

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參加研訊的法律代表

Public Hearing of Evidence from 7 September 1998 up to 31 December 1998
由一九九八年九月七日至十二月三十一日爲止的公開聆訊

Legal Representatives

法律代表

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AEH Joint Venture	Messrs Slaughter & May
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Airlines Operators' Committee	-
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British-Chinese-Japanese Joint Venture	Mr Louis K Y CHAN (instructed by Messrs Masons Solicitors)
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Board of Airline Representatives	-
航空公司代表協會	

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Hong Kong Special Administrative Region Government 香港特別行政區政府	Mr Ronny TONG SC, Mr Ambrose HO and Mr Eugene FUNG (instructed by Department of Justice) 湯家驊資深大律師，何沛謙大律師及馮庭碩大律師 (由律政司延聘)
[The major government departments and bodies concerned with the new airport are: Airport Development Steering Committee New Airport Projects Coordination Office Economic Services Bureau Civil Aviation Department Airport Consultative Committee 與新機場有關的主要政府部門和機構爲： 機場發展策劃委員會 新機場工程統籌署 經濟局 民航處 機場諮詢委員會]	

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Mass Transit Railway Corporation 香港地下鐵路有限公司	Messrs Deacons Graham & James 的近律師行

Ogden Aviation (Hong Kong) Limited 奧格登航空服務(香 港)有限公司	Messrs Johnson Stokes & Master 孖士打律師行
Ove Arup & Partners Hong Kong Ltd 奧雅納工程顧問香港 有限公司	Messrs Simmons & Simmons 西蒙斯律師行
Swire Engineering Services Ltd 太古機電有限公司	Mr Robert Whitehead (instructed by Messrs Simmons & Simmons) 韋浩德大律師 (由西蒙斯律師行延聘）

LIST OF EXPERTS IN THE INQUIRY
參加研訊的專家

Experts Commissioned

委託的專家

The Commission 委員會	Professor Xiren CAO Professor Cao has a doctorate in Applied Mathematics, majoring in control and optimization, from the Harvard University. He is currently the Professor of the Department of Electrical and Electronic Engineering of the Hong Kong University of Science and Technology. As an expert in mechatronics, Professor Cao has extensive industrial experience with major information technology and manufacturing corporations in the US and in the Mainland. (engaged by the Commission) 曹希仁教授 曹教授是哈佛大學應用數學博士，主修控制及優選學，現任香港科技大學電機及電子工程學系教授。曹教授是機電控制專家，曾任職於美國及內地的主要資訊科技及製造公司，在工業界具有豐富經驗。 (由委員會延聘)

Dr Ulrich Kipper

Dr Kipper has a doctorate in Physics. He received his tertiary education from the Johann Wolfgang University, Frankfurt. As an expert of information technology and telecommunications in airport operation, Dr Kipper is currently the Senior Project Manager with the Frankfurt Airport. He was also closely involved with the planning and design of the information technology and telecommunications system of the new Athens International Airport. He has extensive experience in air traffic control system as well as a wide range of operational matters in airport management.

(engaged by the Commission)

Ulrich Kipper 博士

Kipper 博士畢業於法蘭克福 Johann Wolfgang 大學，並取得物理學博士學位。他是機場運作資訊科技及電訊方面的專家，現職爲法蘭克福機場高級項目經理，專責上述範疇的工作。他曾積極參與新雅典國際機場資訊科技及電訊系統的規劃及設計工作，在航空交通管制系統及機場管理方面眾多運作事務上均有豐富經驗。

(由委員會延聘)

Professor Vincent Yun SHEN

Professor Shen received his M.A. and Ph. D. degrees in Electrical Engineering from Princeton University in 1967 and 1969 respectively. He taught at the Computer Sciences Department of Purdue University from 1969 to 1985. He also held visiting positions at Tsing Hua University (Taiwan) and IBM Corp. (California) during that period. Professor Shen joined the Micro-electronics and Computer Technology Corp. in 1985 to work on problems related to large-scale software systems development. He later directed the company's Software Technology Program.

Professor Shen joined the Hong Kong University of Science and Technology in 1990 as Founding Head of the Computer Science Department. He served as Associate Vice President for Academic Affairs at the university from 1996 to 1997 before returning to teaching and research at the department in 1997.

(engaged by the Commission)

沈運申教授

沈教授先後於1967和1969年獲普林斯頓大學頒授電機工程碩士和博士學位。從 1969 至 1985 年，他在普渡大學計算機科學系任教，期間曾在清華大學(台灣)擔任客席教授和在 IBM 公司(美國加州)短期工作。他在 1985 年加入微電子及計算機科技公司(Microelectronics and Computer Technology Corp.)工作，專研大型軟件開發過程中的各樣問題，其後擔任該公司軟件技術部門主

Mr Jason G YUEN

Mr Yuen received his Bachelor degree in Architecture from the University of California, Berkeley. He has served as an airport planning and construction consultant for thirty years. He has extensive experience in providing technical and management related advice on airport management and design. The airport projects he has worked on spanned from those in North America to Asia. In the last six years, Mr Yuen was heavily involved in the San Francisco Airport, USA where he chaired boards and committees ranging from airport construction programme to computerised airport systems.

(engaged by the Commission)

阮志成先生

阮先生是柏克萊加州大學建築學士，任職機場規劃和建築顧問 30 年，負責就機場管理和設計提供技術和管理方面的意見，經驗豐富。他曾參與北美洲和亞洲的機場工程計劃，過去 6 年積極從事美國三藩市機場的工作，擔任多個與機場建築計劃和電腦化系統有關的委員會主席。

(由委員會延聘)

Parties

参加研訊的人士

Hong Kong Air Cargo Terminals Limited (HACTL)

香港空運貨站有

限公司

Mr Max William Nimmo

Mr Nimmo received his Bachelor degree in Electrical Engineering from the Auckland University, New Zealand in 1969. As an experienced manager of technology based companies in industrial automation, communication and computer markets, Mr Nimmo has managed engineering development, engineering production and sales departments. His experience covers engineering design, project management, sales management, marketing, manufacturing logistics, quality assurance and financial management. Since April 1998, Mr Nimmo has been contracted as a Senior Technical Consultant and Project Manager for The Coca Cola Amatil Embedded Software group.

(engaged by HACTL)

Max William Nimmo 先生

Nimmo 先生於 1969 年在新西蘭奧克蘭大學取得電機工程學士學位。他曾在從事工業機械化、通訊及電腦市場業務等以科技爲本的公司擔任經理多年，主管技術發展、技術生產及營業部門，對於技術設計、工程管理、銷售管理、市場營運、生產系統、品質保證及財務管理等均具豐富經驗。自 1998 年 4 月起，Nimmo 先生以合約形式受聘於 The Coca Cola Amatil Embedded Software Group，先後擔任高級技術顧問及項目經理。

Mr Jerome Joseph Jr. Day

Mr Day received his Bachelor degree in Physics from the Holy Cross College in 1959 and his MBA degree from the Wharton School, University of Pennsylvania in 1962. He taught in the MBA Programmes at The Chinese University of Hong Kong from 1972 to 1983 and joined the Hong Kong Baptist University to establish a Computing Studies teaching programme in 1983. Mr Day undertook various jobs at the Hong Kong Baptist University and has retired from the university since December 1997. Mr Day also served as Chairman of the Hong Kong Management Association's Hong Kong Telecommunications Users Group for three annual terms in the late 1980's.

(engaged by HACTL)

Jerome Joseph Jr. Day 先生

Day 先生於 1959 年獲聖十字架學院(Holy Cross College) 頒授理學士(物理學)學位，其後於 1962 年獲賓夕法尼亞大學華頓學院(Wharton School, University of Pennsylvania)頒授工商管理學碩士學位。從 1972 至 1983 年，他在香港中文大學教授工商管理碩士課程，1983 年應聘到香港浸會大學工作，負責制定電腦學教學大綱，先後擔任校內不同職務，1997 年退休。八十年代後期，亦曾任香港管理專業協會轄下香港電訊用戶協會主席 3 年。

LIST OF WITNESSES IN THE INQUIRY
作供證人名單

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
Day 1 第一天	Mon 星期一	07/09/98	W1	Mr Richard Alan Siegel 施高理先生	CAD, Director of Civl Aviation 民航處，民航處處長
Day 2 第二天	Tue 星期二	08/09/98	W1	Mr Richard Alan Siegel 施高理先生	CAD, Director of Civil Aviation 民航處，民航處處長
			W2	Mr YEUNG Kwok Keung 楊國強先生	HACTL, Deputy Managing Director 香港空運貨站有限公司，副常務董事
Day 3 第三天	Wed 星期三	09/09/98	W2	Mr YEUNG Kwok Keung 楊國強先生	HACTL, Deputy Managing Director 香港空運貨站有限公司，副常務董事
Day 4 第四天	Thu 星期四	10/09/98	W2	Mr YEUNG Kwok Keung 楊國強先生	HACTL, Deputy Managing Director 香港空運貨站有限公司，副常務董事
Day 5 第五天	Mon 星期一	14/09/98	W2	Mr YEUNG Kwok Keung 楊國強先生	HACTL, Deputy Managing Director 香港空運貨站有限公司，副常務董事
Day 6 第六天	Tue 星期二	15/09/98	W2	Mr YEUNG Kwok Keung 楊國強先生	HACTL, Deputy Managing Director 香港空運貨站有限公司，副常務董事
Day 7 第七天	Thu 星期四	17/09/98	W3	Dr Henry Duane Townsend 董誠亨博士	AA, Chief Executive Officer 機場管理局，行政總監
Day 8 第八天	Fri 星期五	18/09/98	W3	Dr Henry Duane Townsend 董誠亨博士	AA, Chief Executive Officer 機場管理局，行政總監

Hearing Day **聆訊日次**		**Date** **日期**	**Witness** **證人**		**Organisation & Position** **機構及職位**
Day 9 第九天	Mon 星期一	21/09/98	W3	Dr Henry Duane Townsend 董誠亨博士	AA, Chief Executive Officer 機場管理局，行政總監
Day 10 第十天	Tue 星期二	22/09/98	W3	Dr Henry Duane Townsend 董誠亨博士	AA, Chief Executive Officer 機場管理局，行政總監
Day 11 第十一天	Thu 星期四	24/09/98	W3	Dr Henry Duane Townsend 董誠亨博士	AA, Chief Executive Officer 機場管理局，行政總監
			W4	Mr SEE Seng Wan 徐成遠先生	AAT, Chief Executive Officer 亞洲空運中心有限公司，總裁
			W5	Mr Allan KWONG Kwok Hung 鄺國雄先生	JATS, Assistant General Manager - Operations 怡中機場地勤服務有限公司，助理總經理 - 地勤
Day 12 第十二天	Fri 星期五	25/09/98	W5	Mr Allan KWONG Kwok Hung 鄺國雄先生	JATS, Assistant General Manager - Operations 怡中機場地勤服務有限公司，助理總經理 - 地勤
			W6	Mr Samuel KWOK King Man 郭經文先生	HAS, Business Support Manager 香港新機場地勤服務有限公司，商務支援經理
Day 13 第十三天	Mon 星期一	28/09/98	W6	Mr Samuel KWOK King Man 郭經文先生	HAS, Business Support Manager 香港新機場地勤服務有限公司，商務支援經理
			W7	Mr Anthony Crowley Charter 翟達安先生	HACTL, Managing Director 香港空運貨站有限公司，常務董事
Day 14 第十四天	Tue 星期二	29/09/98	W7	Mr Anthony Crowley Charter 翟達安先生	HACTL, Managing Director 香港空運貨站有限公司，常務董事

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
			W8	Mr Mackenzie Grant 高靈智先生	Ogden, Managing Director 奧格登航空服務(香港)有限公司, 董事總經理
Day 15 第十五天	Wed 星期三	30/09/98	W7	Mr Anthony Crowley Charter 翟達安先生	HACTL, Managing Director 香港空運貨站有限公司, 常務董事
Day 16 第十六天	Mon 星期一	05/10/98	W7	Mr Anthony Crowley Charter 翟達安先生	HACTL, Managing Director 香港空運貨站有限公司, 常務董事
			W9	Mr Gernot Werner	Demag, Senior Project Manager – Controls 曼內斯曼貿易(遠東)有限公司, 高級項目經理 - 監控事務
Day 17 第十七天	Wed 星期三	07/10/98	W10	Mr HO Yiu Wing (with) 何耀榮先生(及)	HACTL, Project Manager Controls 香港空運貨站有限公司, 控制系統項目經理
			W11	Mr LEUNG Shi Min 梁師勉先生	HACTL, Maintenance Manager Cargo Handling System 香港空運貨站有限公司, 維修經理 - 貨物處理系統
Day 18 第十八天	Thu 星期四	08/10/98	W10	Mr HO Yiu Wing (with) 何耀榮先生(及)	HACTL, Project Manager Controls 香港空運貨站有限公司, 控制系統項目經理
			W11	Mr LEUNG Shi Min 梁師勉先生	HACTL, Maintenance Manager Cargo Handling System 香港空運貨站有限公司, 維修經理 - 貨物處理系統
Day 19 第十九天	Fri 星期五	09/10/98	W10	Mr HO Yiu Wing (with) 何耀榮先生(及)	HACTL, Project Manager Controls 香港空運貨站有限公司, 控制系統項目經理

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
			W11	Mr LEUNG Shi Min 梁師勉先生	HACTL, Maintenance Manager Cargo Handling System 香港空運貨站有限公司, 維修經理 - 貨物處理系統
			W12	Mr Johnnie WONG Tai Wah (with) 黃泰華先生(及)	HACTL, General Manager – Operations 香港空運貨站有限公司, 貨運總經理
			W13	Mr Peter PANG Tai Hing (with) 彭泰興先生(及)	HACTL, Manager - Projects and Administration Operations 香港空運貨站有限公司, 策劃及行政經理
			W14	Ms Violet CHAN Man Har (with) 陳文霞女士(及）	HACTL, ST1 Systems Manager 香港空運貨站有限公司, 超級一號貨站電腦系統經理
			W15	Mr Daniel LAM Yuen Hi 林源喜先生	HACTL, Operations Computer Project Manager 香港空運貨站有限公司, 貨運電腦項目經理
Day 20 第二十天	Mon 星期一	12/10/98	W12	Mr Johnnie WONG Tai Wah (with) 黃泰華先生(及)	HACTL, General Manager – Operations 香港空運貨站有限公司, 貨運總經理
			W13	Mr Peter PANG Tai Hing (with) 彭泰興先生(及)	HACTL, Manager - Projects and Administration Operations 香港空運貨站有限公司, 策劃及行政經理
			W14	Ms Violet CHAN Man Har (with) 陳文霞女士(及)	HACTL, ST1 Systems Manager 香港空運貨站有限公司, 超級一號貨站電腦系統經理
			W15	Mr Daniel LAM Yuen Hi 林源喜先生	HACTL, Operations Computer Project Manager 香港空運貨站有限公司, 貨運電腦項目經理

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
Day 21 第二十一天	Tue 星期二	13/10/98	W16	Mr Hiroshi NAKAMURA (with) 中村博司先生(及)	Murata, Project Manager 村田機械(香港)有限公司, 項目經理
			W17	Mr Tomonobu SAEKI (with) 佐伯友信先生(及)	Murata, Project Engineer (Site Construction Manager) 村田機械(香港)有限公司, 項目工程師(工地施工經理)
			W18	Mr Shin YAMASHITA 山下伸先生	Murata, Testing and Commissioning Manager 村田機械(香港)有限公司, 測試及測調經理
Day 22 第二十二天	Thu 星期四	15/10/98	W16	Mr Hiroshi NAKAMURA (with) 中村博司先生(及)	Murata, Project Manager 村田機械(香港)有限公司, 項目經理
			W17	Mr Tomonobu SAEKI (with) 佐伯友信先生(及)	Murata, Project Engineer (Site Construction Manager) 村田機械(香港)有限公司, 項目工程師(工地施工經理)
			W18	Mr Shin YAMASHITA 山下伸先生	Murata, Testing and Commissioning Manager 村田機械(香港)有限公司, 測試及測調經理
			W12	Mr Johnnie WONG Tai Wah (with) 黃泰華先生(及)	HACTL, General Manager – Operations 香港空運貨站有限公司, 貨運總經理
			W13	Mr Peter PANG Tai Hing (with) 彭泰興先生(及)	HACTL, Manager - Projects and Administration Operations 香港空運貨站有限公司, 策劃及行政經理
			W14	Ms Violet CHAN Man Har (with) 陳文霞女士(及)	HACTL, ST1 Systems Manager 香港空運貨站有限公司, 超級一號貨站電腦系統經理

Hearing Day **聆訊日次**		**Date** **日期**	**Witness** **證人**		**Organisation & Position** **機構及職位**
			W15	Mr Daniel LAM Yuen Hi 林源喜先生	HACTL, Operations Computer Project Manager 香港空運貨站有限公司, 貨運電腦項目經理
Day 23 第二十三天	Fri 星期五	16/10/98	W12	Mr Johnnie WONG Tai Wah (with) 黃泰華先生(及)	HACTL, General Manager – Operations 香港空運貨站有限公司, 貨運總經理
			W13	Mr Peter PANG Tai Hing (with) 彭泰興先生(及)	HACTL, Manager - Projects and Administration Operations 香港空運貨站有限公司, 策劃及行政經理
			W14	Ms Violet CHAN Man Har (with) 陳文霞女士(及)	HACTL, ST1 Systems Manager 香港空運貨站有限公司, 超級一號貨站電腦系統經理
			W15	Mr Daniel LAM Yuen Hi 林源喜先生	HACTL, Operations Computer Project Manager 香港空運貨站有限公司, 貨運電腦項目經理
			W19	Mr TSUI Shek Chiu 徐錫釗先生	HACTL, Shift Manager 香港空運貨站有限公司, 值日經理
			W20	Mr Tony KWAN To Wah 關道華先生	HACTL, General Manager - Enginneering 香港空運貨站有限公司, 工程總經理
Day 24 第二十四天	Mon 星期一	19/10/98	W20	Mr Tony KWAN To Wah 關道華先生	HACTL, General Manager - Enginneering 香港空運貨站有限公司, 工程總經理
			W21	Mr Michael Todd Korkowski	EDS, On Site Project Manager of FIDS EDS, 工地工程經理 - 航班資料顯示系統

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
Day 25 第二十五天	Tue 星期二	20/10/98	W21	Mr Michael Todd Korkowski	EDS, On Site Project Manager of FIDS EDS, 工地工程經理 - 航班資料顯示系統
Day 26 第二十六天	Thu 星期四	22/10/98	W21	Mr Michael Todd Korkowski	EDS, On Site Project Manager of FIDS EDS, 工地工程經理 - 航班資料顯示系統
Day 27 第二十七天	Fri 星期五	23/10/98	W21	Mr Michael Todd Korkowski	EDS, On Site Project Manager of FIDS EDS, 工地工程經理 - 航班資料顯示系統
			W22	Mr Edward George Hobhouse 賀孝慈先生	GEC, Project Director 英國通用電器香港有限公司, 項目董事
			W23	Mr Alan LAM Tai Chi (with) 林大志先生(及)	AA, General Manager (Airfield Operations) 機場管理局, 總經理(飛行區運作)
			W24	Ms Rita LEE Fung King 李鳳□女士	AA, IT Project Manager 機場管理局, 項目經理 - 資訊科技
Day 28 第二十八天	Mon 星期一	26/10/98	W23	Mr Alan LAM Tai Chi (with) 林大志先生(及)	AA, General Manager (Airfield Operations) 機場管理局, 總經理(飛行區運作)
			W24	Ms Rita LEE Fung King 李鳳□女士	AA, IT Project Manager 機場管理局, 項目經理 - 資訊科技
Day 29 第二十九天	Tue 星期二	27/10/98	W23	Mr Alan LAM Tai Chi (with) 林大志先生(及)	AA, General Manager (Airfield Operations) 機場管理局, 總經理(飛行區運作)

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
			W24	Ms Rita LEE Fung King 李鳳□女士	AA, IT Project Manager 機場管理局, 項目經理 - 資訊科技
			W25	Mr TSUI King Cheong 徐景祥先生	AA, Project Manager – Electrical & Mechanical Works 機場管理局, 項目經理 - 電機
Day 30 第三十天	Thu 星期四	29/10/98	W25	Mr TSUI King Cheong 徐景祥先生	AA, Project Manager – Electrical & Mechanical Works 機場管理局, 項目經理 - 電機
Day 31 第三十一天	Fri 星期五	30/10/98	W25	Mr TSUI King Cheong 徐景祥先生	AA, Project Manager – Electrical & Mechanical Works 機場管理局, 項目經理 - 電機
			W26	Mrs Vivian CHEUNG Kar Fay (with) 李佳蕙女士(及)	AA, Terminal Systems Manager 機場管理局, 經理 - 客運大樓系統
			W27	Ms Yvonne MA Yee Fong 馬怡芳女士	AA, Project Manager – Information Resource Management 機場管理局, 項目經理 - 資訊資源管理
Day 32 第三十二天	Mon 星期一	02/11/98	W28	Mr Anders YUEN Hon Sing (with) 袁漢昇先生(及)	AA, Assistant Airfield Duty Manager 機場管理局, 飛行區助理值勤經理
			W29	Mr CHAN Kin Sing 陳建成先生	AA, Assistant Airfield Duty Manager 機場管理局, 飛行區助理值勤經理
			W26	Mrs Vivian CHEUNG Kar Fay (with) 李佳蕙女士(及)	AA, Terminal Systems Manager 機場管理局, 經理 - 客運大樓系統

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
			W27	Ms Yvonne MA Yee Fong 馬怡芳女士	AA, Project Manager – Information Resource Management 機場管理局, 項目經理 - 資訊資源管理
Day 33 第三十三天	Tue 星期二	03/11/98	W26	Mrs Vivian CHEUNG Kar Fay (with) 李佳蕙女士(及)	AA, Terminal Systems Manager 機場管理局, 經理 - 客運大樓系統
			W27	Ms Yvonne MA Yee Fong 馬怡芳女士	AA, Project Manager – Information Resource Management 機場管理局, 項目經理 - 資訊資源管理
Day 34 第三十四天	Thu 星期四	05/11/98	W26	Mrs Vivian CHEUNG Kar Fay (with) 李佳蕙女士(及)	AA, Terminal Systems Manager 機場管理局, 經理 - 客運大樓系統
			W27	Ms Yvonne MA Yee Fong 馬怡芳女士	AA, Project Manager – Information Resource Management 機場管理局, 項目經理 - 資訊資源管理
			W30	Mr Ben Reijers	AA, Senior Design Engineer 機場管理局, 高級設計工程師
Day 35 第三十五天	Fri 星期五	06/11/98	W30	Mr Ben Reijers	AA, Senior Design Engineer 機場管理局, 高級設計工程師
			W31	Mr James WONG Hung Kin (with) 黃鴻堅先生(及)	NAPCO, Project Manager 新機場工程統籌署, 新機場核心計劃工程處長
			W32	Mr Jhan Schmitz (with) 史密斯先生(及)	NAPCO, Deputy Consultant Project Manager 新機場工程統籌署, 副工程顧問經理
			W33	Mr KWOK Ka Keung 郭家強先生	NAPCO, Director, NAPCO 新機場工程統籌署, 新機場工程統籌署署長

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
Day 36 第三十六天	Mon 星期一	09/11/98	W31	Mr James WONG Hung Kin (with) 黃鴻堅先生(及)	NAPCO, Project Manager 新機場工程統籌署, 新機場核心計劃工程處長
			W32	Mr Jhan Schmitz (with) 史密斯先生(及)	NAPCO, Deputy Consultant Project Manager 新機場工程統籌署, 副工程顧問經理
			W33	Mr KWOK Ka Keung 郭家強先生	NAPCO, Director, NAPCO 新機場工程統籌署, 新機場工程統籌署署長
Day 37 第三十七天	Tue 星期二	10/11/98	W31	Mr James WONG Hung Kin (with) 黃鴻堅先生(及)	NAPCO, Project Manager 新機場工程統籌署, 新機場核心計劃工程處長
			W32	Mr Jhan Schmitz (with) 史密斯先生(及)	NAPCO, Deputy Consultant Project Manager 新機場工程統籌署, 副工程顧問經理
			W33	Mr KWOK Ka Keung 郭家強先生	NAPCO, Director, NAPCO 新機場工程統籌署, 新機場工程統籌署署長
Day 38 第三十八天	Thu 星期四	12/11/98	W31	Mr James WONG Hung Kin (with) 黃鴻堅先生(及)	NAPCO, Project Manager 新機場工程統籌署, 新機場核心計劃工程處長
			W32	Mr Jhan Schmitz (with) 史密斯先生(及)	NAPCO, Deputy Consultant Project Manager 新機場工程統籌署, 副工程顧問經理
			W33	Mr KWOK Ka Keung 郭家強先生	NAPCO, Director, NAPCO 新機場工程統籌署, 新機場工程統籌署署長
Day 39 第三十九天	Fri 星期五	13/11/98	W31	Mr James WONG Hung Kin (with) 黃鴻堅先生(及)	NAPCO, Project Manager 新機場工程統籌署, 新機場核心計劃工程處長

Hearing Day **聆訊日次**		**Date** **日期**	**Witness** **證人**		**Organisation & Position** **機構及職位**
			W32	Mr Jhan Schmitz (with) 史密斯先生(及)	NAPCO, Deputy Consultant Project Manager 新機場工程統籌署, 副工程顧問經理
			W33	Mr KWOK Ka Keung 郭家強先生	NAPCO, Director, NAPCO 新機場工程統籌署, 新機場工程統籌署署長
			W34	Mr Peter Lindsay Derrick (with)	Preston, Project Manager Preston, 項目經理
			W35	Mr Gordon James Cumming	EDS, Sub-contract Manager EDS, 分包合約事務經理
Day 40 第四十天	Mon 星期一	16/11/98	W36	Mrs CHAN Fang Anson 陳方安生女士	Government, Chief Secretary for Administration 政府, 政務司司長
Day 41 第四十一天	Tue 星期二	17/11/98	W34	Mr Peter Lindsay Derrick (with)	Preston, Project Manager Preston, 項目經理
			W35	Mr Gordon James Cumming	EDS, Sub-contract Manager EDS, 分包合約事務經理
			W37	Mr Dominic Alexander Chartres Purvis (with) 蒲偉誠先生(及)	Cathay Pacific, Manager Customer Services 國泰航空有限公司, 顧客服務經理
			W38	Mr Victor WONG Chu King (with) 黃柱擎先生(及)	Cathay Pacific, Systems Manager Airport 國泰航空有限公司, 機場站系統經理
			W39	Mr Albert LO Sze Wai (with) 羅四維先生(及)	Cathay Pacific, Manager Cargo Services 國泰航空有限公司, 貨運服務經理
			W40	Mr Peter LEE (with) 李彼得先生(及)	Cathay Pacific, Manager Business Improvement 國泰航空有限公司,

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
					業務改進經理
			W41	Ms Vanessa LI Chui Fung 李翠芬女士	Cathay Pacific, Chek Lap Kok Development Co-ordinator 國泰航空有限公司, 赤𫟼角發展統籌
Day 42 第四十二天	Thu 星期四	19/11/98	W34	Mr Peter Lindsay Derrick	Preston, Project Manager Preston, 項目經理
			W42	Mr NG Ki Sing 吳其成先生	AA, General Manager – Terminal Operations 機場管理局, 總經理 - 客運大樓運作
Day 43 第四十三天	Fri 星期五	20/11/98	W42	Mr NG Ki Sing 吳其成先生	AA, General Manager – Terminal Operations 機場管理局, 總經理 - 客運大樓運作
			W43	Mr Douglas Edwin Oakervee (with) 柯家威先生(及)	AA, Project Director 機場管理局, 項目工程總監
			W44	Mr Chern Heed (with) 韓義德先生(及)	AA, Airport Management Director 機場管理局, 機場管理總監
			W45	Mr Kironmoy Chatterjee (with) 陳達志先生(及)	AA, Head of Information Technology 機場管理局, 資訊科技部主管
			W46	Mrs Elizabeth Margaret Bosher 布簡瓊女士	AA, Planning and Co-ordination Director 機場管理局, 規劃及統籌總監
Day 44 第四十四天	Mon 星期一	23/11/98	W43	Mr Douglas Edwin Oakervee (with) 柯家威先生(及)	AA, Project Director 機場管理局, 項目工程總監
			W44	Mr Chern Heed (with) 韓義德先生(及)	AA, Airport Management Director 機場管理局, 機場管理總監

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
			W45	Mr Kironmoy Chatterjee (with) 陳達志先生(及)	AA, Head of Information Technology 機場管理局, 資訊科技部主管
			W46	Mrs Elizabeth Margaret Bosher 布簡瓊女士	AA, Planning and Co-ordination Director 機場管理局, 規劃及統籌總監
Day 45 第四十五天	Tue 星期二	24/11/98	W43	Mr Douglas Edwin Oakervee (with) 柯家威先生(及)	AA, Project Director 機場管理局, 項目工程總監
			W44	Mr Chern Heed (with) 韓義德先生(及)	AA, Airport Management Director 機場管理局, 機場管理總監
			W45	Mr Kironmoy Chatterjee (with) 陳達志先生(及)	AA, Head of Information Technology 機場管理局, 資訊科技部主管
			W46	Mrs Elizabeth Margaret Bosher 布簡瓊女士	AA, Planning and Co-ordination Director 機場管理局, 規劃及統籌總監
Day 46 第四十六天	Thu 星期四	26/11/98	W43	Mr Douglas Edwin Oakervee (with) 柯家威先生(及)	AA, Project Director 機場管理局, 項目工程總監
			W44	Mr Chern Heed (with) 韓義德先生(及)	AA, Airport Management Director 機場管理局, 機場管理總監
			W45	Mr Kironmoy Chatterjee (with) 陳達志先生(及)	AA, Head of Information Technology 機場管理局, 資訊科技部主管
			W46	Mrs Elizabeth Margaret Bosher 布簡瓊女士	AA, Planning and Co-ordination Director 機場管理局, 規劃及統籌總監
Day 47 第四十七天	Fri 星期五	27/11/98	W43	Mr Douglas Edwin Oakervee (with) 柯家威先生(及)	AA, Project Director 機場管理局, 項目工程總監

Hearing Day 聆訊日次		**Date** 日期	**Witness** 證人		**Organisation & Position** 機構及職位
			W44	Mr Chern Heed (with) 韓義德先生(及)	AA, Airport Management Director 機場管理局，機場管理總監
			W45	Mr Kironmoy Chatterjee (with) 陳達志先生(及)	AA, Head of Information Technology 機場管理局，資訊科技部主管
			W46	Mrs Elizabeth Margaret Bosher 布簡瓊女士	AA, Planning and Co-ordination Director 機場管理局，規劃及統籌總監
Day 48 第四十八天	Mon 星期一	30/11/98	W3	Dr Henry Duane Townsend 董誠亨博士	AA, Chief Executive Officer 機場管理局，行政總監
			W47	Mr Graham Morton	Guardforce, Project General Manager 衛安有限公司，新機場合約工程總經理
Day 49 第四十九天	Tue 星期二	1/12/98	W48	Mr Billy LAM Chung Lun 林中麟先生	AA, Deputy Chief Executive Officer 機場管理局，副行政總監
			W47	Mr Graham Morton	Guardforce, Project General Manager 衛安有限公司，新機場合約工程總經理
Day 50 第五十天	Thu 星期四	3/12/98	W49	Mr LO Chung Hing (with) 盧重興先生(及)	AA, Board - Vice Chairman 機場管理局，董事會副主席
			W50	Mr WONG Po Yan 黃保欣先生	AA, Board - Chairman 機場管理局，董事會主席
			W51	Mr Jason G YUEN 阮志成先生	Expert for the Commission 委員會延聘的專家
Day 51 第五十一天	Fri 星期五	4/12/98	W51	Mr Jason G YUEN 阮志成先生	Expert for the Commission 委員會延聘的專家

Hearing Day 聆訊日次		Date 日期	Witness 證人		Organisation & Position 機構及職位
Day 52 第五十二天	Mon 星期一	7/12/98	W52	Mr Max William Nimmo (with)	Expert for HACTL 香港空運貨站有限公司延聘的專家
			W53	Mr Jerome Joseph Jr. Day	Expert for HACTL 香港空運貨站有限公司延聘的專家
Day 53 第五十三天	Tue 星期二	8/12/98	W52	Mr Max William Nimmo (with)	Expert for HACTL 香港空運貨站有限公司延聘的專家
			W53	Mr Jerome Joseph Jr. Day	Expert for HACTL 香港空運貨站有限公司延聘的專家
Day 54 第五十四天	Wed 星期三	9/12/98	W54	Professor Xiren CAO 曹希仁教授	Expert for the Commission 委員會延聘的專家
			W55	Dr Ulrich Kipper (with)	Expert for the Commission 委員會延聘的專家
			W56	Professor Vincent Yun SHEN 沈運申教授	Expert for the Commission 委員會延聘的專家
Day 55 第五十五天	Thu 星期四	10/12/98	W55	Dr Ulrich Kipper (with)	Expert for the Commission 委員會延聘的專家
			W56	Professor Vincent Yun SHEN 沈運申教授	Expert for the Commission 委員會延聘的專家
Day 56 第五十六天	Fri 星期五	11/12/98	W55	Dr Ulrich Kipper (with)	Expert for the Commission 委員會延聘的專家
			W56	Professor Vincent Yun SHEN 沈運申教授	Expert for the Commission 委員會延聘的專家

機場管理局董事會成員名單(1998 年 6 月)

MEMBERS OF THE BOARD OF THE AIRPORT AUTHORITY (AS AT JUNE 1998)

黃保欣先生	主席
Mr WONG Po Yan	Chairman
盧重興先生	副主席
Mr LO Chung Hing	Vice Chairman

行政總監，董誠亨先生

Dr Henry Townsend, the Chief Executive Officer

經濟局局長，葉澍堃先生

Mr Stephen IP, the Secretary for Economic Services

庫務局局長，俞宗怡女士

Miss Denise YUE, the Secretary for the Treasury

工務局局長，鄺漢生先生

Mr KWONG Hon Sang, the Secretary for Works

新機場工程統籌署署長，郭家強先生

Mr KWOK Ka Keung, the Director, NAPCO

民航處處長，施高理先生

Mr Richard Siegel, the Director of Civil Aviation

香港金融管理局總裁，任志剛先生

Mr Joseph YAM, the Chief Executive, HK Monetary Authority

何世柱先生

Mr HO Sai Chu

梁錦松先生

Mr Anthony LEUNG

羅康瑞先生

Mr Vincent LO

譚惠珠女士

Miss Maria TAM

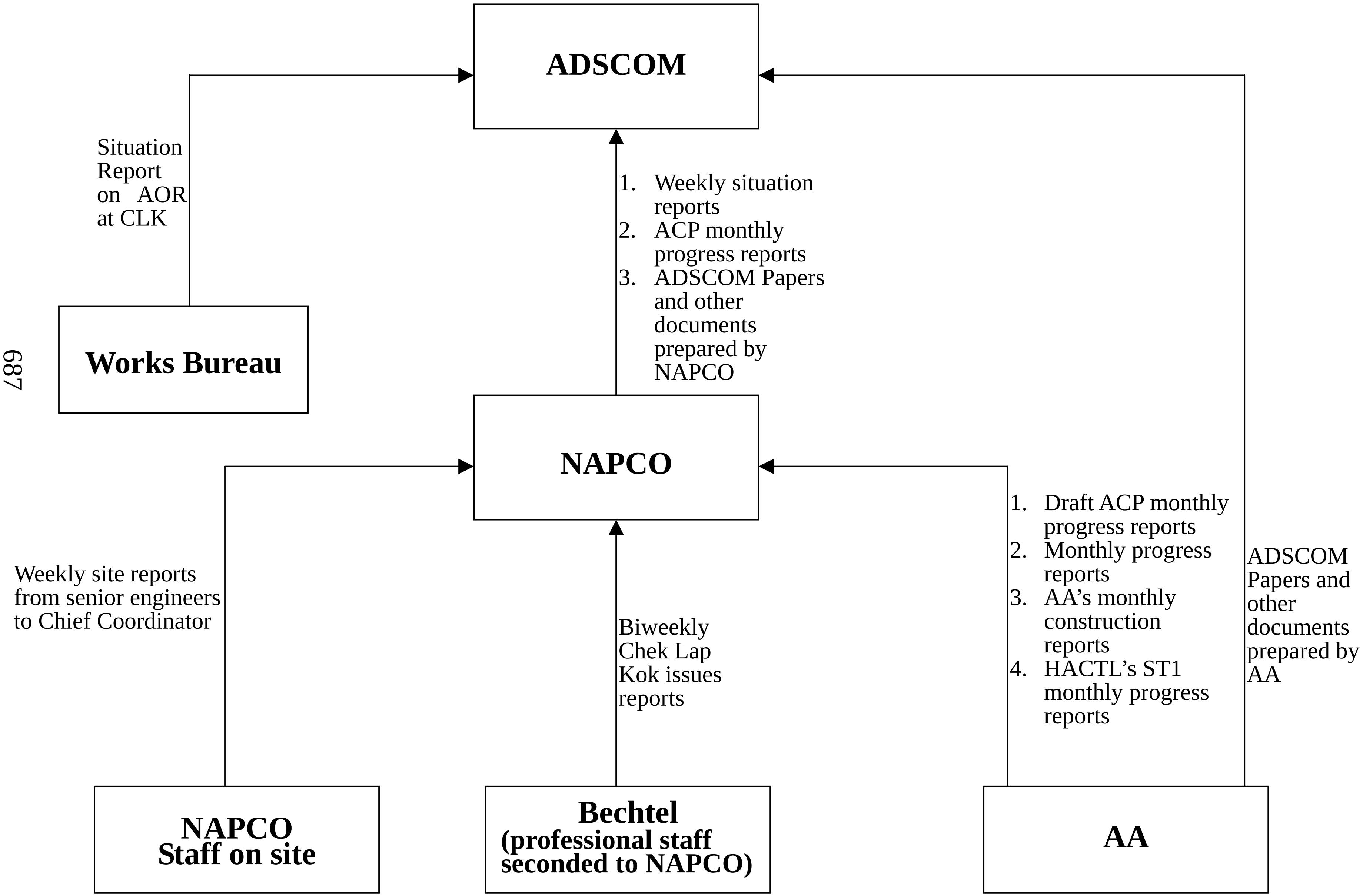
黃景強博士

Dr Peter WONG

黃宜弘博士

Dr Philip WONG

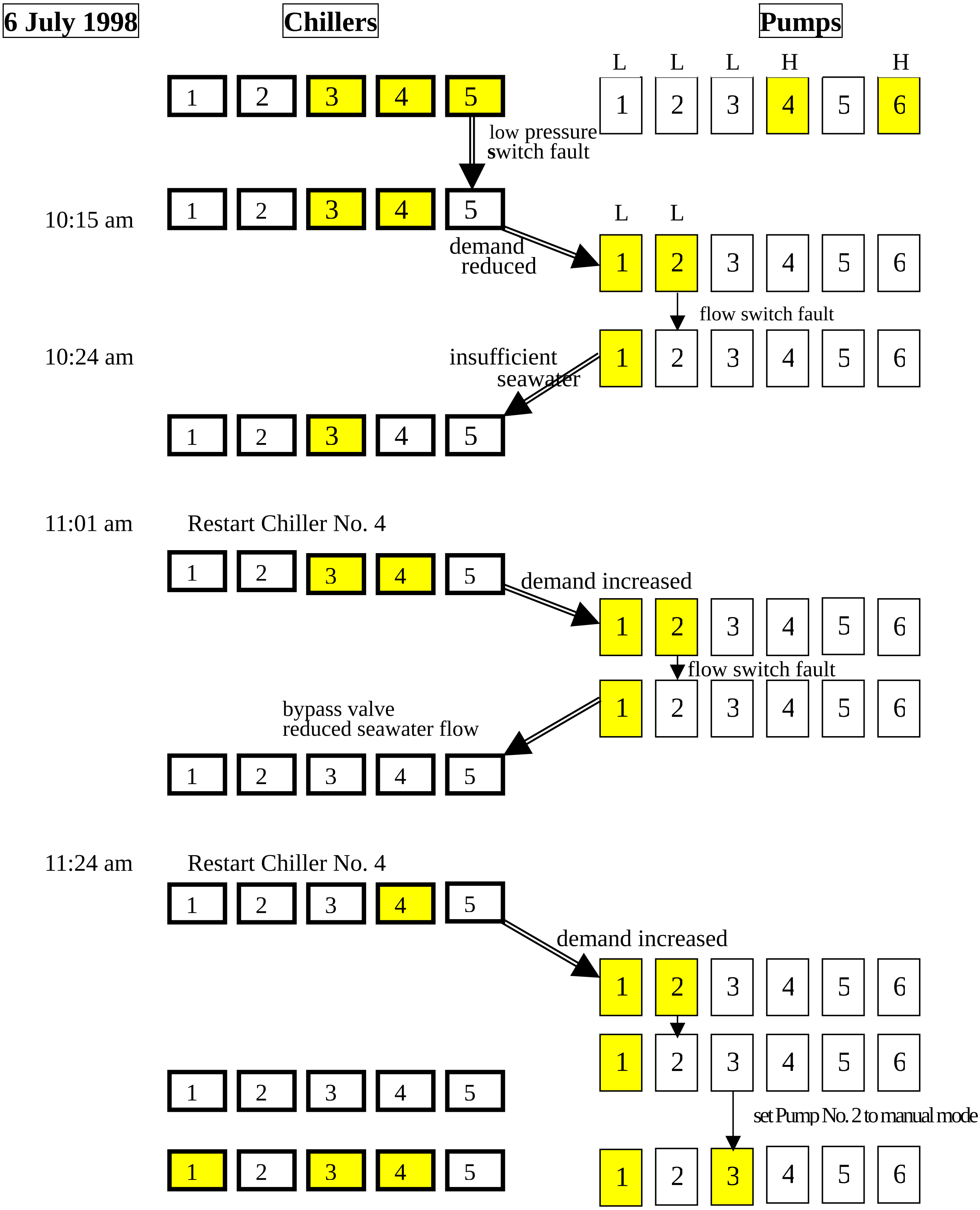
CHANNEL OF DOCUMENTARY COMMUNICATION TO ADSCOM



ORGANIZATION CHART OF THE AIRPORT AUTHORITY (AS AT 31 JULY 1998)
機場管理局組織架構（一九九八年七月三十一日）

- BOARD – Chairman, WONG Po Yan / 董事會 – 主席 黃保欣
  - General Manager - Chairman's Office, Peter TAM / 總經理 – 主席辦公室 譚仲豪
  - Chief Internal Auditor, William YEUNG / 總內部稽查師 楊永健
  - Head of Project Monitoring, KWEI See Kan / 項目監察主管 桂詩勤
  - Chief Executive Officer, Henry Townsend / 行政總監 董誠亨
    - Head of Information Technology, Kiron Chatterjee / 資訊科技部主管 陳達志
    - Project Director, Douglas Oakervee / 項目工程總監 柯家威
    - Deputy Chief Executive Officer, Billy LAM / 副行政總監 林中麟
      - Finance & Commercial Director, Raymond LAI / 財務及商務總監 黎永昌
      - Airport Management Director, Chern Heed / 機場管理總監 韓義德
      - Planning & Co-ordination Director, Elizabeth Bosher / 規劃及統籌總監 布簡瓊
      - Legal Director, Josiah KWOK / 法律總監 郭展禮
      - Corporate Development Director, Clinton Leeks / 機構拓展總監 列擘志
      - Human Resources Director, Sophia KAO / 人力資源總監 高靜芝

DIAGRAMMATIC PRESENTATION OF AIR-CONDITIONING PROBLEMS ON AOD



Legends

L = low speed pumps H = high speed pumps

The yellow boxes indicate that the machine was running.

DIAGRAM SHOWING THE INTER-LINK BETWEEN FIDS AND OTHER SYSTEMS

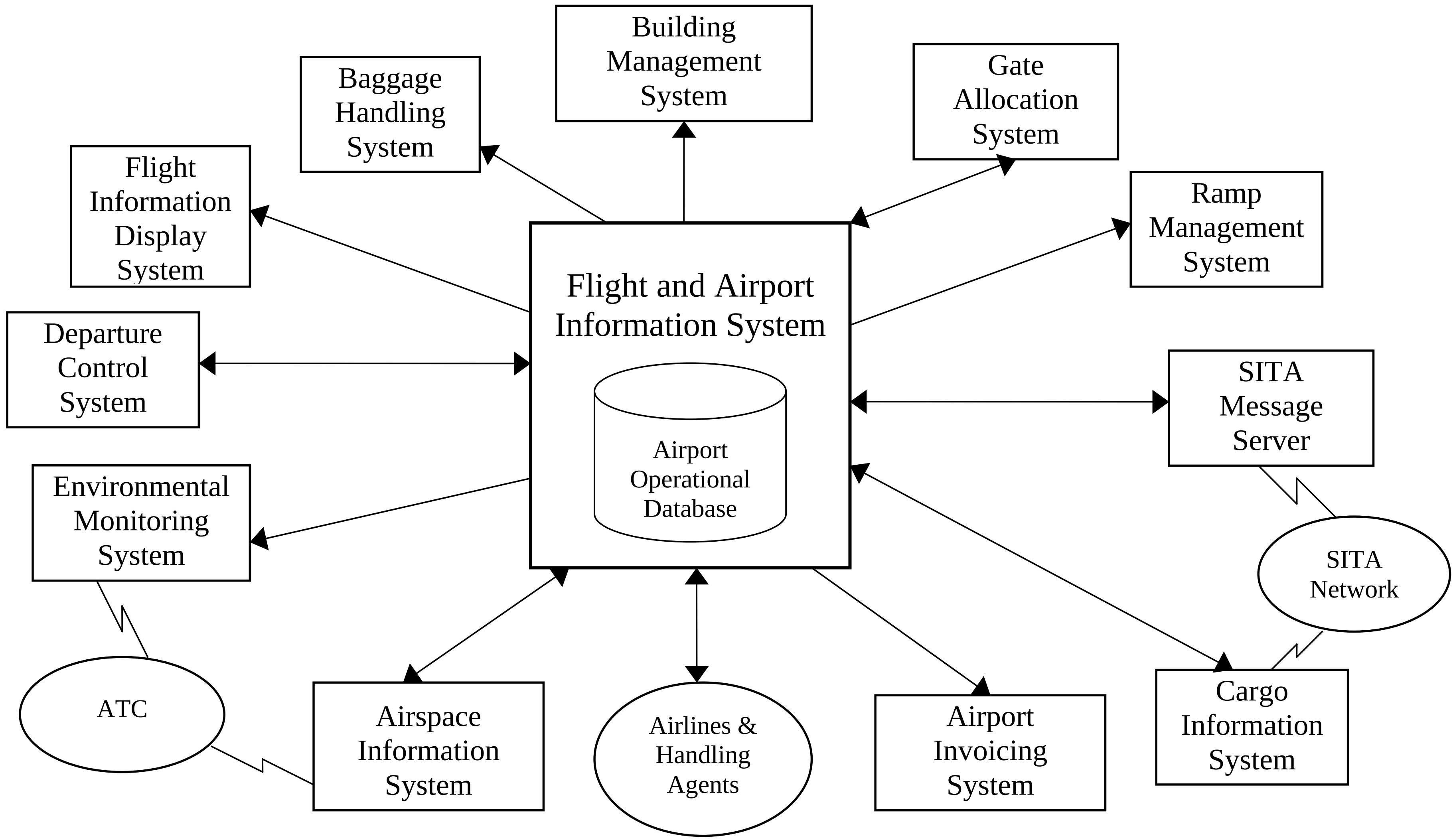
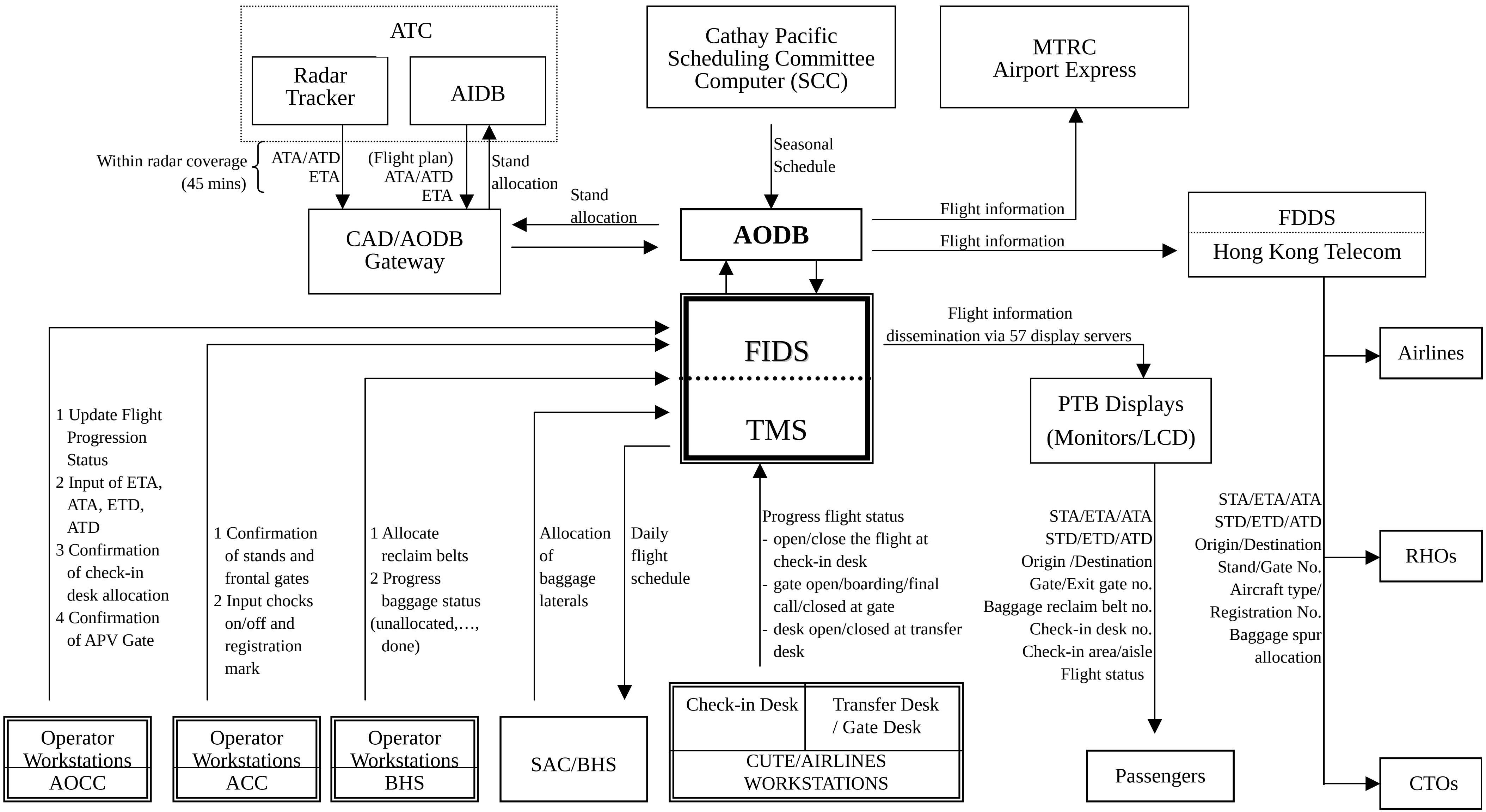


DIAGRAM SHOWING USE OF FIDS



FLIGHT INFORMATION EXPERIENCES OF VARIOUS FDDS USERS AND MTRC

	Cathay Pacific Catering Services	China Aircraft Services Ltd.	Japan Airlines Company Limited	Kwoon Chung Motors	Kowloon Hotel	LSG Lufthansa Sky Chefs	Regent Hotel	Swiss Air Transport Co. Ltd.	Mass Transit Railway Corporation
Purpose of use of FDDS	To enable servicing of aircraft	To enable servicing of aircraft	To enable servicing of aircraft	To plan bus times for travel agency service	For guests and own operations	To enable servicing of aircraft	For guests	For own flights and connecting flights, parking position, baggage delivery	**NB: not a customer of FDDS; information straight from AODB.** Information for inflight check in (HK, Kowloon), passengers (Tsing Yi), meeters (all), seat back display
Nature of problems aside from inaccurate or incomplete information				Disconnection without notice	Shrinkage of screen	No testing data available pre-AOD			Satisfactory service

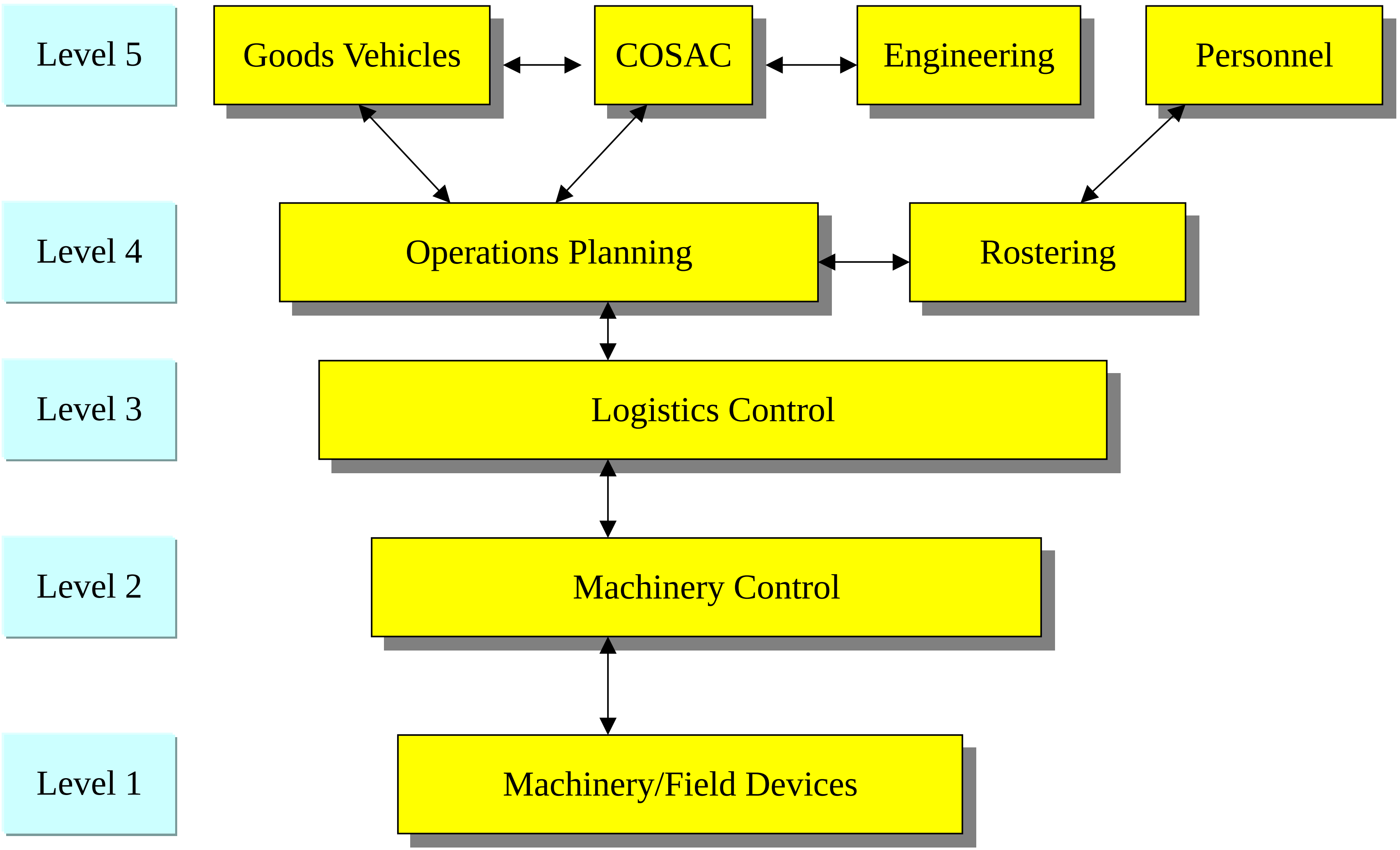
Appendix XI
Page 1

	Cathay Pacific Catering Services	China Aircraft Services Ltd.	Japan Airlines Company Limited	Kwoon Chung Motors	Kowloon Hotel	LSG Lufthansa Sky Chefs	Regent Hotel	Swiss Air Transport Co. Ltd	Mass Transit Railway Corporation
Types of information subscribed to ***(those in bold italics are those incompletely received on airport opening)***	STA ***ETA*** ***ATA*** STD ***ETD*** ***ATD*** ***Flight number*** Flight status Destination ***Bay*** Gate Aircraft type Handling agent	STA ***ETA*** ***ATA*** STD ***ETD*** ***ATD*** Flight Aircraft type Origin Destination ***Bay*** Flight status	***STA*** ***ETA*** ***ATA*** ***STD*** ***ETD*** ***ATD*** ***Flight number*** ***Origin*** ***Destination*** ***Bay*** ***Gate*** ***Baggage reclaim*** ***Check in aisle*** ***Generally not updated; cannot recall exactly which types of data not completely received***	***STA*** ***ETA*** ***ATA*** ***STD*** ***ETD*** ***ATD*** ***Flight number*** ***Origin*** ***Destination*** ***Gate*** ***Check in aisle*** ***Hall*** ***Remarks*** ***Generally not updated; cannot recall exactly which types of data not completely received***	***STA*** ***ETA*** ***ATA*** ***STD*** ***ETD*** ***ATD*** ***Flight number*** ***Origin*** ***Destination*** ***Gate*** ***Check in aisle*** ***Remarks*** ***Generally not updated; cannot recall exactly which types of data not completely received***	STA ***ETA*** ***ATA*** STD ***ETD*** ***ATD*** Flight number ***Flight status*** Destination ***Bay*** Gate Aircraft type Handling agent	STA ***ETA*** ***ATA*** STD ***ETD*** ***STD*** ***Status***	***ETA*** ***ETD*** ***Bay*** ***Connecting flights bay*** ***Baggage reclaim*** ***Screen blank on Day 1. Otherwise, wrong information***	STA ETA (if long delay) STD ETD (if long delay) Flight number Origin Destination Check in desk status Time now Remarks [No ATA or ATD]

	Cathay Pacific Catering Services	China Aircraft Services Ltd.	Japan Airlines Company Limited	Kwoon Chung Motors	Kowloon Hotel	LSG Lufthansa Sky Chefs	Regent Hotel	Swiss Air Transport Co. Ltd.	Mass Transit Railway Corporation
Dates of incomplete receipt	Weeks 1 & 2	Days 1 & 2 - nothing at all for Day 1 and Day 2 am	First few days	Weeks 1, 2, 3	Week 1	Week 1: incorrect information Week 2: information after plane arrived	3 months	First few days	Day 1: no information until 1000 19.9.98: outdated information from 1430 to 1730 28.9.98: outdated information from 1719 to 1915
Dates of resumption of receipt	Week 4	Day 2 pm. Accuracy improved from about Day 10	Unsure; about Week 2		around Day 8	Week 2 or Week 3	29.9.98	Week 2	
How information received in meantime	Phone/fax from airlines; physical check	Phone/fax from airlines; physical check	ATC, AOCC, AA FIDS control room in PTB	Fax from HKT	Calling airlines	Fax from HKT four times a day between Day 1 and Day 10	Calling airlines	Engineers monitored ATC frequency then called office	
Whether HKT advised rebooting	Yes	No reboot needed	Yes	System always required rebooting [not specified whether HKT advised]	Yes	No	No	Yes	
Whether rebooting helped	No	NA	Sometimes	Yes but not always	No	NA	NA	Did not try	

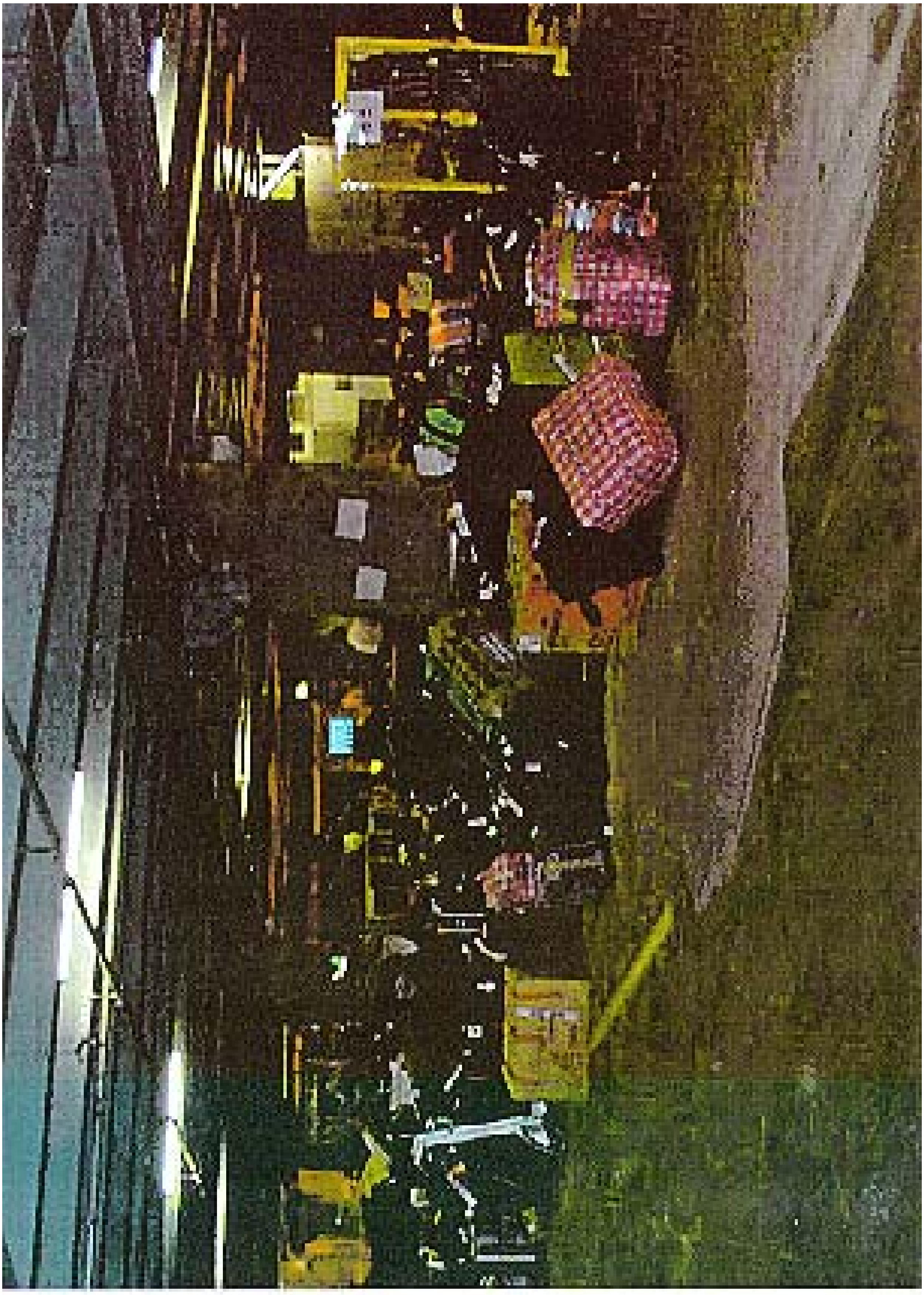
	Cathay Pacific Catering Services	China Aircraft Services Ltd.	Japan Airlines Company Limited	Kwoon Chung Motors	Kowloon Hotel	LSG Lufthansa Sky Chefs	Regent Hotel	Swiss Air Transport Co. Ltd.	Mass Transit Railway Corporation
HKT_s explanation of problems	None	HKT responsible only for transfer of data, not responsible for source of data	Did not ask	Kwoon Chung only have a dial up line, which is unstable. Normal and essential to reboot. Unless get leased line, stability not guaranteed	FDDS itself received outdated data from CLK database Screen shirnkage: Kowloon Hotel chose wrong URL (web site address) and obtained wrong display format	Flight information from AA database	None	None	
Whether problems foreseen	No	No	Noticed shortage of phone/data lines on 5.7.98 and therefore thought there might be problem	No	No		No	No	

DIAGRAM SHOWING CHS OF HACTL WITH ITS FIVE LEVELS



Appendix XII

PICTURES SHOWING THE PROBLEM BAG AREA IN THE BAGGAGE HALL



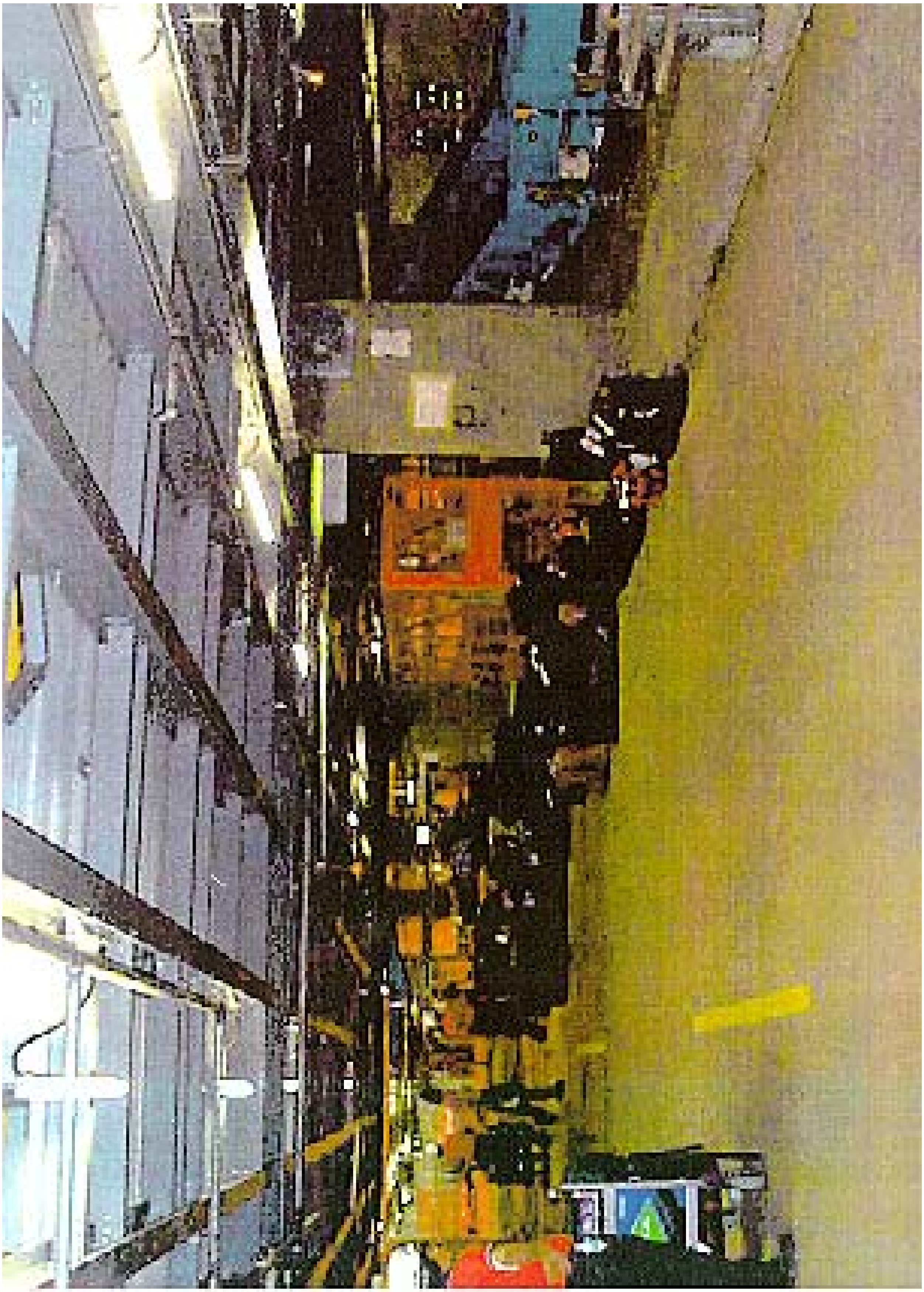
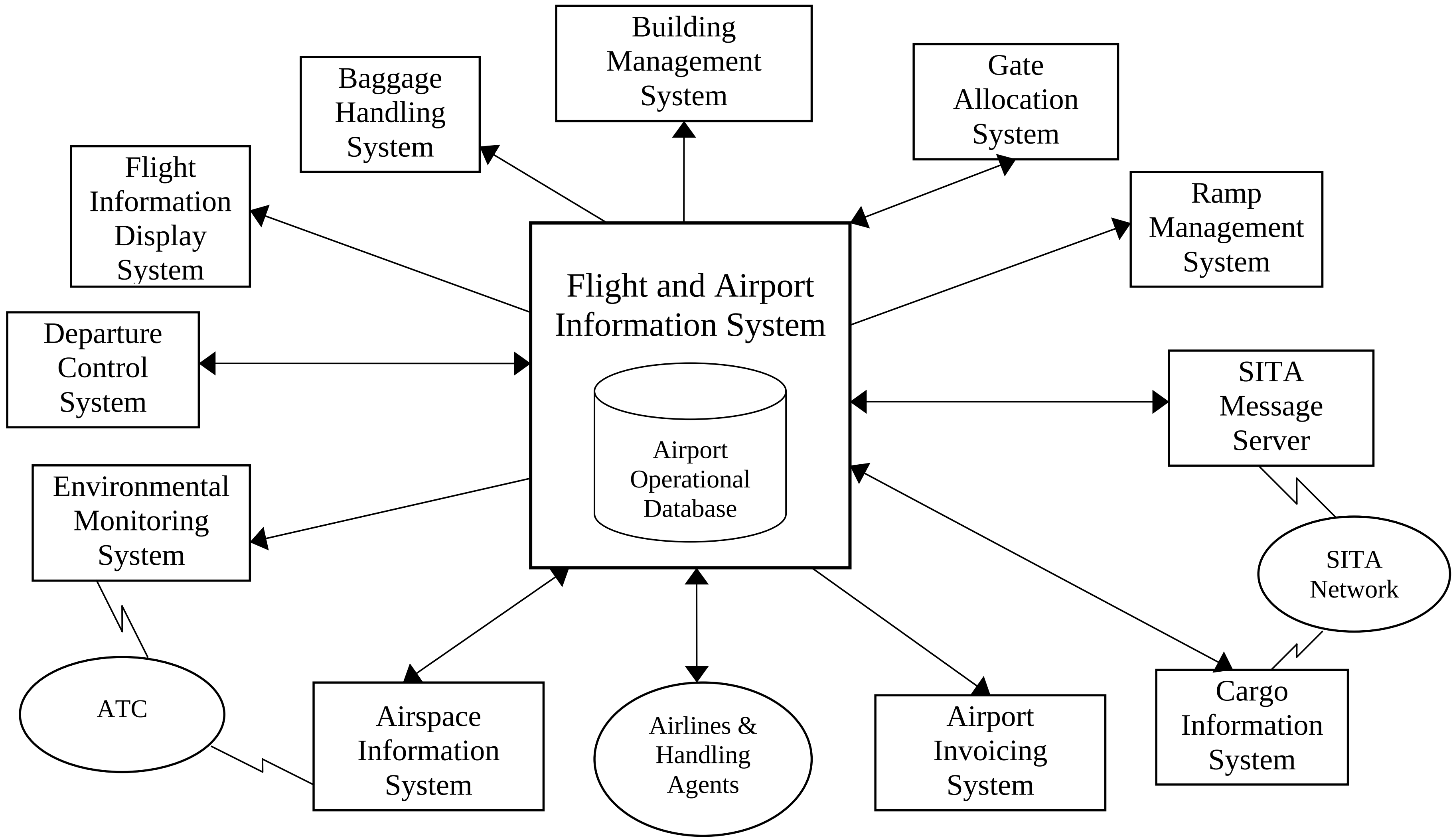
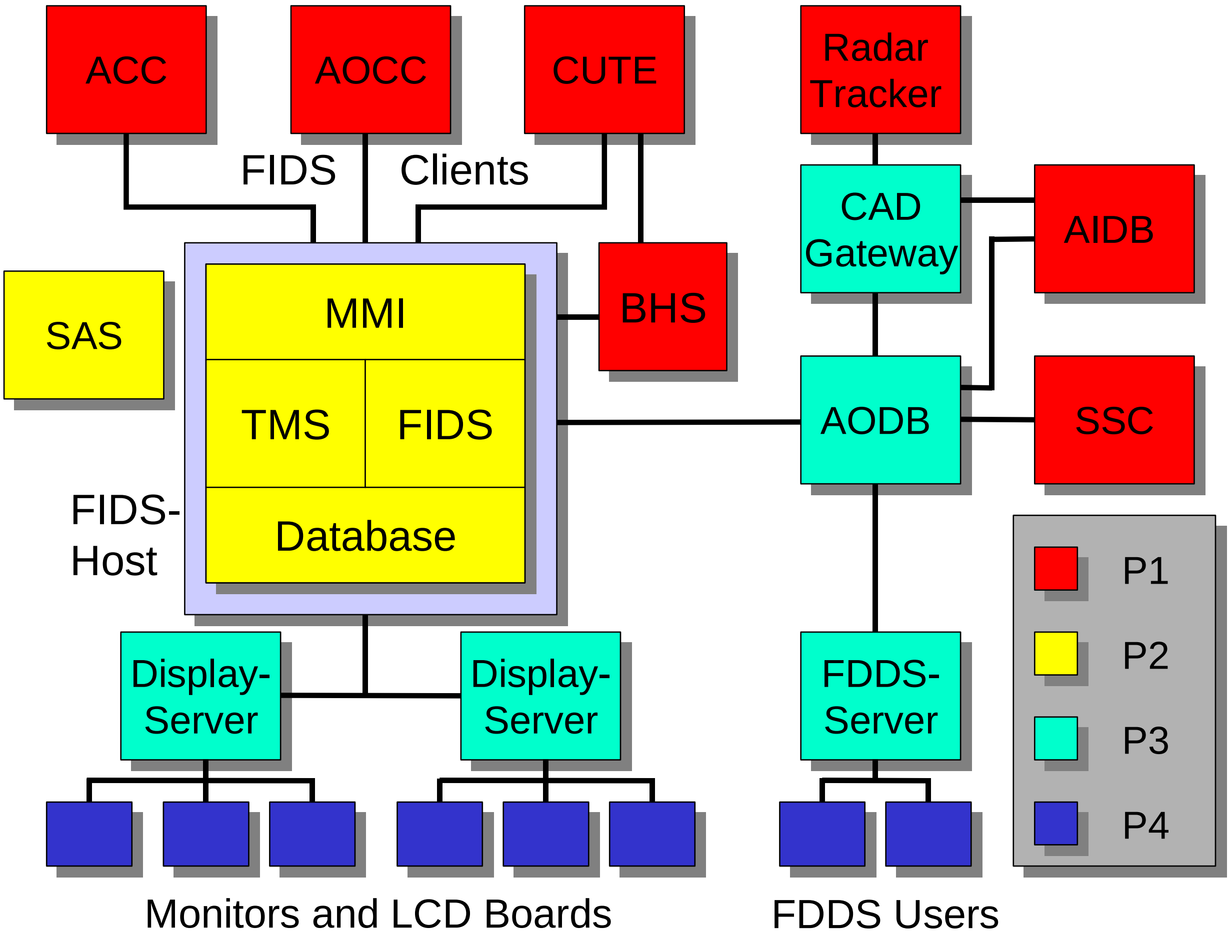


DIAGRAM SHOWING THE INTER-LINK BETWEEN FIDS AND OTHER SYSTEMS



Appendix XV

DIAGRAM SHOWING THE ALLOCATION
OF FIDS RELATED COMPONENTS
OF AIRPORT OPERATIONS INTO PROBLEM AREAS



Legends:

P1	Data Generation
P2	Data Processing
P3	Data Transmission
P4	Data Display

BRIEF SUMMARY OF SOME AIRPORT OPERATIONAL STATISTICS

	Kai Tak	**New Airport at CLK**					
		Day 1	Day 2	Day 3	Day 4	Day 10	28 December 98
		Mon	Tue	Wed	Thu	Wed	to 3 January 99
	1 Week in July	6 July 1998	7 July 1998	8 July 1998	9 July 1998	15 July 1998	(average)
Number of Flights	1997						
- Incoming		213	227	220	240	225	227
- Outgoing		207	227	220	240	225	227
Incoming Flights - Actual Time Vs Scheduled Time							
- Early Arrival & On Time		51%*	32%	34%	46%	48%	46%
- Delay							
(1) Within 15 Minutes		7%	20%	21%	23%	27%	29%
(2) Within 30 Minutes		23%	34%	35%	36%	41%	41%
(3) Within 60 Minutes		36%	48%	53%	47%	49%	48%
(4) More Than 60 Minutes		13%	20%	13%	7%	3%	6%
Average Delay for Incoming Flights (Hours) [Excluding Early & On-Time Flights]	0.4 hr	0.4 hr	0.8 hr	0.6 hr	0.6 hr	0.4 hr	0.5 hr
Outgoing Flights – Actual Time Vs Scheduled Time							
- Delay Within 15 Minutes		0%	7%	6%	15%	47%	78%
- Delay Within 30 Minutes		3%	15%	25%	36%	77%	90%
- Delay Within 60 Minutes		13%	38%	66%	75%	94%	95%
- Delay More Than 60 Minutes		87%	62%	34%	25%	6%	5%
Average Delay for All Outgoing Flights (Hours)	0.5 hr	2.6 hr	1.7 hr	0.9 hr	0.7 hr	0.4 hr	0.3 hr
Total Passengers (In + Out)			86,000	84,000	91,000	84,000	86,000
Number of Departure Bags Left at the End of the Day (i.e. bags that missed their flight on that day)		5,000	6,000	2,000	1,400	108	-

Time of First Bag Arrival in Baggage Hall After Aircraft Landing (Random Samples)

- Earliest			20 mins	17 mins	8 mins	4 mins
- Average			50 mins	47 mins	24 mins	12 mins
- Latest			1 hr 20 mins	2 hr 4 mins	55 mins	22 mins
Time of Last Bag Arrival in Baggage Hall After Aircraft Landing (Random Samples)						
- Earliest			40 mins	41 mins	10 mins	10 mins
- Average			1 hr 7 mins	1 hr 16 mins	33 mins	25 mins
- Latest			1 hr 30 mins	2 hr 33 mins	1 hr 25 mins	42 mins
Total Number of Departure Bags Processed (Originating and Transfer) [Excluding Arrival Bags]	20,000	24,000	26,000	27,000	32,000	-
Airport Cargo Throughput (HACTL, AAT, Express Cargo)					2,699 tonnes	3,579 tonnes

*Holding time of aircraft on the taxiway is not included.

Appendix XVI