Public Accounts Committee
Consideration of Chapter 4 of the Director of Audit's Report No. 63
Administration of the air traffic control and related services

(a) whether the Civil Aviation Department ("CAD") had solicited comments from users of Autotrac III regarding its performance prior to the award of the Air Traffic Management System ("ATMS") contract? If yes, please provide the relevant record;

CAD had sought comments from users at the reference sites provided by the tenderers during the tender evaluation process. The relevant records of request for information are provided in **Appendix I**.

(b) a list of current users of Autotrac III;

The Autotrac III systems are currently used by airports in Dubai, as well as in Delhi, Mumbai and Chennai of India. ATMS designed and manufactured by the contractor with the same crucial sub-systems as Autotrac III are also widely used in Germany, United States and Canada.

(c) ***according to the Conditions of Tender for replacement of the ATMS, the Government reserves the right to conduct visits to the factory(ies) and reference site(s) of all the tenderers who have passed Stage 2 evaluation to verify compliance with the essential requirements. In this regard, please provide the following-***

(i) a list of the reference sites provided by each of the tenderers who have passed Stage 2 evaluation;

The list of reference sites submitted by each of the tenderers is provided in **Appendix II**.

(ii) the reasons for not conducting visits to those reference sites in (i); and

During the technical assessment of the tender proposals for the ATMS, the Tender Assessment Panel (TAP) had conducted site visits to factories of all the 5 tenderers that had met the mandatory requirements in the tender document. The TAP had also devised and issued a set of questionnaire inviting written responses from users of the reference sites provided by the tenderers. This was considered to be a more efficient and cost-effective arrangement given the following considerations:

****Note by Clerk, PAC:** Only a sample of CAD's letters and questionnaires is attached.*

- In view of the complexity and highly technical nature of the ATMS, it would be more effective for CAD to conduct factory visits to assess the technical capability of the tenderers as more specific and comprehensive on-site tests or inspections of the systems of the tenderers could be conducted, and questions could be raised with the tenderers on the spot, which could facilitate direct communications and clarifications with the tenderers.

- A factory setup would provide a more suitable environment for the tenderers to demonstrate their latest technology and the essential features of the ATMS, especially those safety-critical ones, with the use of test beds or simulators.

(iii) records of the request made by CAD to the air traffic control service providers or other parties of the reference sites for information on the relevant air traffic systems provided by the tenderers, and their replies;

The relevant records of request for information are provided in **Appendix I** as stated in Item (a) above.

(d) with reference to Clause 8.1(h) of the Conditions of Tender, the tenderers are required to provide serviceability/availability figures showing that the system was put in service for no less than 6 consecutive months any time within the last 10 years preceding the Tender Closing Date. The 6 consecutive-month period is also used in other paragraphs of Clause 8.1. In this regard, please provide;

(i) the reason for using "no less than 6 consecutive months" as the minimum track record requirement and in other paragraphs of Clause 8.1; and

CAD has set down as a mandatory requirement that the tenderers are required to provide serviceability/availability figures showing that the system was put in service for no less than 6 consecutive months any time within the last 10 years preceding the Tender Closing Date. Based on operational experience and the experience of CAD during the Chek Lap Kok Hong Kong International Airport project, a six-month period should be sufficient to identify key anomalies that may arise in the system.

(ii) the minimum track record requirement for procuring the existing ATMS Autotrac I in 1993. If there was a change in the requirement, the justification for such change in view of the fact that 6 months might not fully reflect the performance of the system;

For the existing ATMS, i.e. Autotrac I, there was no particular requirement in the tender document that the proposed system installed at the reference site must have a minimum operation period. However, the tenderer was still requested to provide 12 months' serviceability / availability figures as reference if available. With experience gained over the years, CAD adopted a no-less than six-months' mandatory requirement for the new ATMS tender. This minimum operation period was also adopted in the tender documents of other major air traffic control systems.

(e) with reference to Clause 8.4 of the Conditions of Tender, records showing that CAD has conducted the due process to ensure that all five tender proposals were in compliance with the requirement that the proposed System should have proven performance record;

CAD had strictly followed the evaluation procedures as laid out in the Conditions of Tender, notably in Clause 8.4, which are in line with international and industry practice. CAD verified compliance of the tenderers' proposed systems against all the essential requirements through checking their submitted documents, clarification with the tenderers, and solicitation of information through questionnaires including the user feedback, system performance and tenderer performance, etc. CAD also conducted visits to the factory sites of all the five tenderers (with same set of checklist items sent in advance to all the tenderers) to verify that their proposed systems could meet the relevant essential requirements (see **Appendix III** for records).

(f) referring to Clause 20.1 of the Conditions of Tender, the alternative proposals, if any, submitted by each tenderer;

Only one tenderer submitted an alternative proposal, but was not considered by TAP as it did not comply with the tender requirements.

(g) whether the tender price difference between the two tenderers whose combined score is the highest and second highest respectively is below the total cost of two contract variations for the ATMS contract, i.e. $89 million;

[redacted]

Since the enhancement items implemented in the two contract variations were triggered by the latest ICAO development and evolving operational requirements, it would be incumbent upon CAD to implement these out-of-contract-scope enhancements as soon as practicable.

****Note by Clerk, PAC: Please see Appendix 14 of this Report for Appendix III.***

(h) whether CAD had assessed the performance of the contractor prior to submitting the request for the first contract variation? If yes, please provide the relevant information/records on the result of the performance assessment;

Prior to submitting the request for the first contract variation to the GLD in January 2012, CAD had considered the contractor's performance based on the following facts:

- Since award of new ATMS contract in February 2011, the contractor had timely submitted the monthly progress reports, and the performance was satisfactory.
- The contractor had timely submitted the acceptance test procedures for the computer-based training system, and conducted the test as scheduled.
- During the detailed design review (DDR), the contractor had engaged a team of professional system and software engineers, particularly those who had sound knowledge and experience in the existing ATMS, to participate into the DDR. The contractor demonstrated professionalism in the system design, and devoted a lot of efforts to incorporate the discussed requirements into the detailed design documents of the system.
- Contractor of new ATMS is also the contractor of the existing ATMS and the service provider of the software maintenance support service of the existing ATMS. The performance of the existing system was stable and reliable whilst the contractor's performance had been satisfactory to CAD.

(i) the source of funding to cover the two contract variations in the procurement of the ATMS;

The funding for the two contract variations was provided from the budget approved by the Finance Committee of the Legislative Council in 2007.

(j) relevant extracts of the ATMS contract provisions relating to claims against delay in the implementation of the contract and termination of contract;

The relevant clauses covering Liquidated Damage (LD) and termination of contract are in Clauses 17 and 45 of Conditions of Contract and provided in **Appendix IV**.

(k) with reference to the additional requirements in the ATMS by way of contract variation referred to in paragraphs 2.6 and 2.9 of Chapter 4, please provide:

(i) a breakdown of the cost by items listed out in paragraph 2.6 (a), (b) and (c) for Contract Variation No. 1;

The cost of ATMS enhancements in Contract Variation No.1 (CV#1) was HK$42.4M.

[Please refer to **Appendix V** for detailed pricing figures.]

(ii) a breakdown of the cost by items listed out in paragraph 2.9 for Contract Variation No. 2; and

The cost of Contract Variation No. 2 (CV#2) was HK$46.8M.

[Please refer to **Appendix V** for detailed pricing figures.]

(iii) the reasons for having 50 positions for ATMS, but only requiring the contractor to provide 32 simulator training and input operator positions in the contract;

The provision of around 50 operational controller working positions and 32 simulator training and input operator positions of the ATMS would ensure efficient operation of the air traffic management services at the Hong Kong Flight Information Region while professional training is provided to air traffic control staff.

Around 50 operational controller positions are provided for air traffic controllers to conduct 24-hour air traffic management services to flight operating within the Hong Kong Flight Information Region. The provision is made on the basis of operational experience, taking into account the heavy traffic volume operating in and out of the HKIA. The simulator training positions are set up to provide training to CAD air traffic controllers in batches and to evaluate the air traffic control procedures. The provision of 32 simulator training and input operator positions were proposed on the basis of the steady air traffic growth and to allow more training opportunities for the air traffic controllers to ensure there are sufficient and adequately trained controllers to provide safe and efficient air traffic management services.

(l) criteria on whether and when an enhancement to ATMS should be made, in particular for enhancements arising from new requirements from International Civil Aviation Organization;

****Note by Clerk, PAC: Please see Appendix 31 of this Report for Appendix V.***

In implementing an enhancement on the ATMS, CAD's key considerations are compliance with international stipulations, aviation safety, operational needs and cost-effectiveness.

Whenever ICAO promulgates an initiative (e.g. the Global Air Navigation Plan, the Regional ATM Contingency Plan etc.) for enhancement of safety and operational efficiency, all states/administrations are required to map out plans to implement the initiatives, taking into account the operational efficiency, aviation safety and cost-effectiveness.

As the new ICAO requirement came out during project stage, it would be more cost-effective and of lower safety risks for the new measures to be incorporated before the system is put in operation as there would be greater synergy on software development/testing, and minimal impact on operations.

(m) the countries in the Asia-Pacific Region and other regions of the world which have adopted the Air traffic Management contingency arrangements referred to in paragraph 2.7 (a) of Chapter 4;

We are checking with the ICAO on the details, and would provide the requested information once available.

(n) The total cost of 23 enhancements to the existing ATMS;

Since commencement of the system design in 1994 up to now, a total of 23 software changes have been made to the existing ATMS for system enhancements. The total cost of the software enhancement changes was HK$61 million.

(o) relevant extracts of the ATMS contract provisions relating to the capacity of air traffic control;

Extracts of the capacity requirements are in **Appendix VI**.

(p) whether consideration had been given to engaging external experts to assist in the procurement of ATMS in view of the complexity involved;

During the early stage of system procurement, CAD had looked into the need and suitability on engagement of external experts. However, given the tight time frame and the highly technical nature of the project, it would be more cost-effective and efficient to make use of CAD staff who would be in a better position to communicate the users' requirements and needs directly to the contractor. Also, CAD considered that engaging external consultants would involve higher costs due to extra coordination and supervision on the consultant.

(q) with reference to the overdue en-route navigation charges referred to in Table 6 of Chapter 4, please provide:

(i) the latest figure on the total overdue amount;

As at 7 January 2015, the total overdue amount of en-route navigation charges was $21.3 million.

(ii) details of the overdue amount with the longest overdue period; and

The debtor with the longest overdue period owes $0.8 million. The earliest outstanding demand note owed by this debtor was due in June 2008.

(iii) details of the cases which involved an overdue amount of $250,000 or more, including the amount involved, length of the overdue period and follow-up actions taken, including whether any unrecoverable amount will be written off;

Details of such payment overdue cases and follow-up actions are detailed in **Appendix VII**.

(r) whether CAD has reported to LegCo about the two contract variations and delays in implementing the ATMS contract. If yes, please provide the relevant papers and correspondences; and

Project progress and contract variations had been included in replies to Members of the Legislative Council (LegCo), the LegCo Panel on Economic Development Panel, and the Finance Committee of LegCo. A list of the correspondences is in **Appendix VIII**.

(s) number of suppliers invited to submit proposals for the ATMS Autotrac I Tender in the early 1990s.

A total of 30 potential suppliers were invited to submit tender proposals for the existing ATMS. The list of invitees is provided in **Appendix IX**.

(t) <u>Extra Item (Request item in 2nd letter from PAC also dated 7 January 2015)</u>
Provide details of the complaint lodged by an unsuccessful tenderer of the ATMS contract concerning the requirement of possession of "proven performance record" by the contractor as specified in Clause 8.4 of the

****<u>Note by Clerk, PAC</u>:*** ***Please see Appendix 44 of this Report for Appendix VII and Appendix VIII not attached.***

Conditions of Tender, and the decision of the Review Body on Bid Challenges on this case.

Please see **Appendix X** for the complaint lodged by the unsuccessful tenderer and the decision of the Review Body on Bid Challenges on this case.

Encl.

* * * end * * *

***Note by Clerk, PAC:** Please see Appendix 24 of this Report for Appendix X.*

A sample of CAD's letters and questionnaires

香港特別行政區政府
民航處
Civil Aviation Department
The Government of the Hong Kong Special Administrative Region

香港國際機場東輝路 11 號港龍大廈三樓
3/F, Dragonair House, 11 Tung Fai Road, Hong Kong International Airport, Hong Kong

檔案編號 OUR REF.	來函編號 YOUR REF.	電話 TEL.	圖文傳真 FAX.
(6) in T/FAC/3040/1/3 C 耳		(852) 2591 5051	(852) 2845 7160

By Fax (5 pages)
7 May 2010

[redacted] ← Address of Recipient

Dear [redacted] ← Recipient's Name

Site Reference for Tendering of Air Traffic Management System for Hong Kong International Airport

The Civil Aviation Department of Hong Kong SAR Government is now tendering for a new Air Traffic Management System (ATMS) for the Hong Kong International Airport. One of the tenderers, [redacted] indicated your ACC Centre as a reference site of their ATMS system installed and in operation.

We would like to seek your kind assistance in providing your input by completing and returning the attached questionnaire by fax and email. The information provided will be of invaluable reference in our assessment of the tender and treated as confidential information.

Should you have any queries, please contact the undersigned at Tel: (852) 2591 5002, Fax: (852) 2845 7160 or email: pcchan@cad.gov.hk.

Your early reply by 14 May 2010 is much appreciated.

Yours faithfully,

(P C Chan)
for Director-General of Civil Aviation

c.c. Director of Government Logistics (Attn.: Mr. Joe Wong) Fax: 2807 2764

Attachment

Questionnaire on Air Traffic Management System (ATMS)

1. ATMS Description

a) Location of installed ATMS [redacted]

b) Manufacturer : [redacted]

c) Model of ATMS : _____

d) Software version : _____

2. ATMS Implementation

a) Planned ATMS acceptance date : _____

b) Actual ATMS acceptance date : _____

c) Date of ATMS put into operation : _____

d) Is the ATMS currently in operation ? If not,

(i) the reason is _____
(ii) date of ceasing operation _____

e) ATMS installed includes :

1. Air Traffic Control Centre (ATCC) Operational partition Yes / No
2. Tower Control Operational partition Yes / No
3. Fallback partition Yes / No
4. Development partition Yes / No
5. Air Traffic Control Centre Simulator partition Yes / No

f) For this ATMS, during the period of operation as stated above, state the maximum number of working positions installed and in operation at this location, with the following position-type breakdown:

1. Number of ATCC air traffic controller working positions _____
2. Number of Tower air traffic controller working positions _____
3. Number of Flight Plan/Data Coordination positions _____
4. Number of ATCC and Tower Supervisor positions _____

3. ATMS Performance

a) Major ATMS failures after operational use

ATMS failures	Number and brief descriptions of the failures	Duration (hrs)
(1) Total ATMS outages* (complete service loss)		
(2) Other major failures*		

**please provide detail information on separate sheet of paper, if considered necessary*

b) Overall ATMS performance ratings (please tick one or more boxes below)

- ☐ ATMS unsatisfactory for operation
- ☐ ATMS unreliable
- ☐ generally not meeting specification requirements
- ☐ generally satisfactory
- ☐ very satisfactory and fully meet specification requirements
- ☐ totally satisfactory for operation

c) Operational and Technical performance ratings (please tick one box for each item)

1 - unsatisfactory
2 - generally good but with many limitations
3 - good but with some or minor limitations
4 - good, flexible and effective
5 - very good, very flexible and very effective

Operational Performance Ratings	1	2	3	4	5
(a) User Friendliness					
Controller tools including Safety Net features e.g. range & bearing line, predicated line, STCA					
ATMS response to controller input					
Setting up of ATC display e.g. maps, colours, ranges, sector consolidation					
(b) Design Ergonomics					
HMI colour scheme e.g. background, maps, labels					
HMI control device e.g. softkeys, hotkeys					
(c) Adaptation to different External System Interfaces e.g. FPL, ATS messages, weather data, wind data					
(d) Online On/Off Capability of ATMS Functions e.g. Safety net tools, CPDLC, audio/visual alarm					

Technical Performance Ratings	1	2	3	4	5
(a) Procedure of uploading new/revised DMS					
(b) Flexibility in HMI customization e.g. change colour, line width, fonts					
(c) Flexibility in System Configuration e.g. online VSP, making up of sectors and airspace					

(d) Ease of System Set-up e.g. whether the VSPs provided are useful					
(e) Trajectory Computation Accuracy					
(f) Safety Net Prediction Accuracy e.g. STCA, MTCD					
(g) ATMS Reliability					
(h) ATMS Availability					
(i) ATMS Maintainability					

Overall ATMS Performance					

4. Contractor/Supplier Performance

Specific contractor/supplier performance ratings (please tick one box for each performance item)

1 - unsatisfactory
2 - below expectation or cannot fully comply with contractual obligations
3 - good
4 - very good
5 - exceptionally good

Contractor/Supplier performance ratings	*1*	*2*	*3*	*4*	*5*
(a) Technical competence of project staff					
(b) Technical competence of post acceptance support staff					
(c) Responsiveness					
(d) Co-operation					
(e) Quality of work					
(f) Sense of responsibility					
(g) Quality of documentation					
(h) Quality of training					
(i) After-sales hardware support					
(j) After-sales software support					
(k) Overall performance					

5. Additional information

a) Average training required in terms of training hours and/or man-days for the following ATC positions in order to achieve the required competency of your organisation:-

i) ATC Area Radar / Enroute Sector ..... _____
ii) ATC Approach Radar ..... _____
iii) Tower Control Air Movements (Runway / Circuit) ... _____
iv) Tower Control Ground Movements (Non-Runway) ... _____
v) Flight Data Operator ..... _____

vi) ATC Supervisor ..... _____
vii) Database Management Supervisor ..... _____
viii) Hardware Maintenance ..... _____
ix) Software Maintenance ..... _____
x) Database Management (Technical) ..... _____

c) Convenience, effectiveness and limitations of the HMI for ATC / Flight data input e.g. clearance update; flight plan amendments.

d) The skills required and the composition and size of your ATMS database management team.

e) Whether all the required data in the ATMS database, such as maps are set up by the contractor, upon receiving of such data provided by your organisation at various stages of the project? Please advise any problems encountered with the contractor/ supplier in the process of setting up ATMS database.

f) Any difficulties/problems encountered during the acceptance tests subsequent to FAT.

g) Level of flexibility / adaptability of the ATMS HMI to meet new user requirements since ATMS operation e.g. implementation of new ICAO FPL requirements.

h) Comment the performance of the following, if installed:
(i) Availability of Multi-sensor tracking
(ii) Integration of AMAN and/or DMAN

i) Any issues on ATMS changeover i.e. from Main to Fallback or from Primary server to Secondary server, particularly on changover time and data synchronization?.

Thank you for completing this questionnaire! Grateful if you would advise a contact for further reference.

* * * Thank you * * *

ReferenceSitesprovidedbyTenderers(basedonTenderers'Proposals-Schedule3A)

Name of Tenderer	Name of Reference Site(s) / Location
Tenderer A	• [redacted] • [redacted] • [redacted] • [redacted] • [redacted] • [redacted]
Tenderer B (Successful Tenderer)	• Moncton, Gander, Winnipeg, Montreal, Toronto, Vancouver, and Edmonton ACC/Canada • P1 controls 4 ACCs: Frankfurt-Langen, Dusseldorf, Bremen and Munich/Germany • United States National Airspace System (NAS)/USA
Tenderer C	• [redacted] • [redacted] • [redacted] • [redacted] • [redacted] • [redacted]

ReferenceSitesprovidedbyTenderers(basedonTenderers'Proposals-Schedule3A)

Name of Tenderer	Name of Reference Site(s) / Location
Tenderer D	• [redacted]
Tenderer E	• [redacted] • [redacted] • [redacted] • [redacted] • [redacted] • [redacted] [redacted] • [redacted] • [redacted] • [redacted] • [redacted] • [redacted]

16.2 The System Acceptance Tests for a Sub-System shall not be deemed to have been passed until all tests in each of the FAT, SAT, FCAT and RAT have been satisfactorily completed with results accepted by the Government in writing.

16.3 The Contractor shall agree that the Government may use the CBT System and Simulator System at no cost for the purpose of training prior to the issuance of the Acceptance Certificate for Phase 1 ATMS. Without prejudice to other obligations of the Contractor, the Contractor shall provide free of charge such maintenance services as may be necessary to maintain the CBT System and Simulator System in full working order until Phase 1 ATMS is accepted by the Government.

17. Delays

17.1 The Contractor shall provide each of the Sub-Systems Ready for Service on or before the Completion Date, viz Phase 1 ATMS Ready for Service by the applicable Completion Date specified in the Implementation Plan, and Phase 2 ATMS Ready for Service by the applicable Completion Date specified in the Implementation Plan.

17.2 If the Contractor fails to provide a Sub-System Ready for Service by the Completion Date, the Contractor shall pay to the Government within 7 days upon demand by the Government as and by way of liquidated damages and not as a penalty for any loss or damage sustained by the Government resulting from delay during the period from the Completion Date to the date on which the Contractor actually provides the Sub-System Ready for Service the sum of HK$52,190 for each day or part of the day of such delay up to a total maximum of HK$5,219,000 in the case of Phase 1 ATMS, and HK$34,314 for each day or part of the day of such delay up to a maximum of HK$3,431,400 in the case of Phase 2 ATMS. Subject to the provisions of Clause 17.3 below the payment of such sums shall be in full satisfaction of the Contractor's liability for such delay only. The payment of liquidated damages shall not relieve the Contractor of its obligation to provide the Sub-System Ready for Service or of any other liability or obligation under this Contract.

17.3 If the Contractor fails to provide any Sub-System Ready for Service within 60 days after the Completion Date then notwithstanding anything else contained in this Contract, unless the Contractor has been given an extension of time under Clause 6 which extends the time to provide the Sub-System Ready for Service, the Government shall be entitled to terminate this Contract pursuant to Clause 44.1.8 (in the case the Sub-System which fails to become Ready for Service is Phase 1 ATMS) or pursuant to Clause 44.2 (in the case the Sub-System which fails to become Ready for Service is Phase 2 ATMS). Upon such termination the Contractor shall, without prejudice to the Government's other rights and claims, forthwith refund to the Government (i) all moneys previously paid to the Contractor under this Contract (in the case the delay relates to Phase 1 ATMS) or (ii) the Total System Price attributable to Phase 2 ATMS (in the case the delay relates to Phase 2 ATMS).

Contractor or all or any part of its business or assets; or

44.1.6 the Contractor abandons the Contract in part or in whole; or

44.1.7 the Contractor assigns or transfers or purports to assign or transfer all or any part of the Contract or all or any of its rights or obligations thereunder without the prior written consent of the Government; or

44.1.8 without prejudice to the generality of the foregoing grounds for termination, if any event or circumstance occurs which enables the Government to terminate the Contract under any one of the following provisions:

Clause 12.3(d) (FAT);

Clause 13.3(d)(i) (SAT);

Clause 14.3(d) (FCAT)

Clause 15.2(c)(i) (RAT);

Clause 17.3 (Delays);

Clause 30.3.4 (Intellectual Property Rights Indemnities);

Clause 40.4 (Prevention of Bribery);

Clause 46.3 (Force Majeure);

Clause 48.4 (Software Asset Management);

Clause 51.1 (Illegal Workers); and

Clause 52.6 (Admission to Government's Premises).

44.2 The Government may terminate the Contract to the extent it relates to Phase 2 ATMS ("Partial Termination") if any event or circumstance occurs which enables the Government to do so under any one of the following provisions:

Clause 13.3(d)(ii) (SAT);

Clause 15.2(c)(ii) (RAT); or

Clause 17.3 (Delays).

45. Consequences of Early Termination

45.1 Upon early termination (howsoever occasioned) or expiry of the Contract ("Termination"):

45.1.1 the Contract shall be of no further force and effect, but without prejudice to:

(a) the Government's rights and claims under the Contract or otherwise at law against the Contractor arising from antecedent breaches of the Contract by the Contractor (including any breach(es) which entitle the Government to terminate the Contract);

(b) the rights and claims which have accrued to a party prior to the Termination; and

(c) the continued existence and validity of those provisions which are expressed to or which in their context appropriately survive Termination and any provisions of the Contract necessary for the interpretation or enforcement of the Contract including without limitation Clauses 1 (Definitions), 22 (Title and Risks to the System), 23 (Vesting of Intellectual Property Rights in the Government), 24 (Exclusion from Vesting), 25 (Licences), 26 (Warranties and Undertaking), 27 (No Warranty on the Part of the Government), 29 (Indemnities), 30 (Intellectual Property Rights Indemnities), 35.5 to 35.6, 35.9 to 35.13 (apart from Clause 35.11) (Payment), and all remaining Clauses thereafter except for Clause 49 (Policy of Insurance and Compensation), 52 (Admission to Government's Premises); the obligations of the parties under these provisions shall continue to subsist notwithstanding the Termination regardless of whether or not it is so expressly stated in these individual provisions;

45.1.2 the Government shall not be responsible for any claim, legal proceeding, liability, loss (including any direct or indirect loss, any loss of revenue, profit, business, contract or anticipated saving), damage (including any direct, special, indirect or consequential damage of whatsoever nature) or any cost or expense, suffered or incurred by the Contractor due to the Termination;

45.1.3 the Government may, without prejudice to any accrued rights and claims of the Government for breach of the whole or any part of Contract, itself take up the uncompleted Services (or any part thereof) or contract out the uncompleted Services (or any part thereof) to another contractor(s) or procure the Contractor Supplied Components and/or other items offered by the Contractor in the Contract from other contractor(s) whereupon in the event of termination pursuant to Clause 44.1, the Contractor shall be liable for all losses, damage, costs and expenses thereby incurred by the Government arising from the Termination including without limitation the amounts payable to any subsequent contractor or supplier and/or the cost of maintaining an in-house team for procuring all or any of the Services and/or Contractor Supplied Components and/or other items which are in excess of the amounts which would have been payable to the Contractor for the same had the Contract not been terminated;

45.1.4 the Contractor shall refund to the Government forthwith any sums previously paid under the Contract for the SS&M Services in respect of the unexpired Hardware and Software Maintenance Periods and for Contractor Supplied Components which were ordered but have not been delivered and accepted prior to the Termination; and in the case the Termination occurs before Phase 1 ATMS becomes Ready for Service, the Contractor shall refund to the Government forthwith all sums paid in discharge of the Total System Price;

45.1.5 for the avoidance of doubt, the Government may exercise its right under Clause 55 in relation to any sum payable to the Contractor;

45.1.6 not used;

45.1.7 the Contractor shall forthwith deliver to the Government all parts of the System, all Acquired Property (including Licensed Property), all Government Data and all Records in whatever format, and stored in whatever media, which are in the possession or under the control of the Contractor. In the event that any of the aforesaid materials or items are located within the premises of the Contractor, the Government Representative and any person(s) authorized by it are hereby granted an irrevocable licence to, anytime and from time to time within one year after termination of the Contract, enter such premises for the purpose of taking possession of such materials or items. In the event that any of the aforesaid materials or items is lost or damaged whilst in the possession or control of the Contractor or its employees, sub-contractors or agents, the Contractor shall pay to the Government for such loss or damage being an amount equal to the original cost plus 10% as and for liquidated damages and not as a penalty. A count of the articles or materials in the possession or control of the Contractor may be made at any time by the Government and the Contractor shall render such assistance as is necessary for this purpose;

45.1.8 the Contractor shall certify to the Government that no hardcopies or softcopies or duplicates of any of the items referred to in sub-clause 45.1.7 have been retained;

45.1.9 the Contractor shall compile and submit to the Government a report of the Services performed, including without limitation a report on all Implementation Services and the SS&M Services which have thus far been completed and discharged up to the date of the Termination;

45.1.10 notwithstanding anything herein to the contrary, and regardless of the cause (the absence thereof) or basis for the Termination, the Government shall have no obligation to pay to the Contractor any money whatsoever arising from the Termination;

45.1.11 the Contractor shall make good, to the satisfaction of the Government, any damage to the System or any part thereof or the Acquired Property (including Licensed Property) or Government Data or Records;

45.1.12 at the request of the Government, the Contractor shall enter into and perform all deeds of assignment, transfer or novation in favour of the Government or in favour of any person whom the Government may designate, for the assignment, transfer or novation of any contract, arrangement or other subject matter whatsoever (including insurance policy, equipment lease, software licence) on such terms and conditions as the Government may stipulate; and procure any other third party whom the Government considers necessary for effecting or perfecting such assignment, transfer or novation to enter into and perform any such deeds of assignment, transfer or novation;

45.1.13 the Contractor will, or will procure its associates or associated persons to, do all

such acts, and sign all such deeds and documents, which are required to be done or signed, under the Contract, or otherwise as directed by the Government Representative, to ensure the complete handover of the System and the Services to the Government or a succeeding contractor, or otherwise as may be necessary or desirable to implement or to give legal effect to the provisions of the Contract, and the transactions provided for or contemplated by the Contract including this Clause 45; and

45.1.14 all Contractor Personnel shall immediately vacate the Government premises which they were allowed to be stationed or were given access to for performing the Services and surrender all access cards/keys.

45.2 Upon a termination of the Contract to the extent it relates to Phase 2 ATMS ("Terminated Services") (ie Partial Termination) pursuant to Clause 44.2:

45.2.1 the provisions in the Contract which concern or relate to the Phase 2 ATMS shall be of no further force and effect, but without prejudice to:

(a) the Government's rights and claims under the Contract or otherwise at law against the Contractor arising from antecedent breaches of the Contract by the Contractor;

(b) the rights and claims which have accrued to a party prior to the Partial Termination;

(c) the continued existence and validity of all remaining provisions of the Contract;

45.2.2 the same consequences specified in Clause 45.1 (apart from Clause 45.1.1 and 45.1.4) shall apply save that references to "Termination" shall mean "Partial Termination; references to "Services" shall mean "the Services as they apply to Phase 2 ATMS", "Contractor Supplied Components" shall mean those for Phase 2 ATMS; and reference to "Clause 44.1" in Clause 45.1.3 shall read Clause 44.2; and

45.2.3 references in the Contract to "ATMS" or "System" shall from then on mean Phase 1 ATMS only.

46. Force Majeure

46.1 For the purpose of this Clause, "Force Majeure" means:

(a) an outbreak of war (whether war be declared or not) affecting Hong Kong ; or

(b) invasion of Hong Kong ; or

(c) civil war, rebellion, revolution or military or usurped power in Hong Kong ; or

(d) riot, commotion or disorder in Hong Kong ; or

(e) Act of God ; or

System Capacity Requirements

Clause 3.1, Final Specifications:

3.1 The ATMS shall have the following system capacity:

(a) Accommodate the concurrent operations of 120 controller working positions and supervisor working positions;

(b) Manage 8,000 flight plans with at least 2,000 of which being active at any one time (active in this context meaning having SSR code assigned and the ATMS will start target-flight plan association once the code is detected by the SDP); and

(c) Process and display 1,500 targets (surveillance data for aircraft/flight) simultaneously and on a continuous basis.

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