

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

The detailed response of the Civil Aviation Department (CAD) to the Public Accounts Committee's letter of 15 December 2014 on management of the new Air Traffic Control (ATC) System Project is set out in the ensuing paragraphs.

(a), (b) and (c) – Procurement and tender assessment of the Air Traffic Management System

Procurement

2. The CAD grouped the 18 ATC systems and facilities as proposed in the funding paper approved by the Finance Committee of the Legislative Council in May 2007 into eight major system contracts as detailed in **Appendix I**. Item (a) of the list is the Air Traffic Management System (ATMS). The CAD has strictly followed the rules and procedures as stipulated in the Government Stores and Procurement Regulations (SPR) and the World Trade Organisation Government Procurement Agreement (WTO GPA) throughout the procurement of the ATMS with a view to upholding fairness and impartiality of the tendering exercise.

Tender assessment

3. Through an open tender exercise, a total of five tender proposals were received for the ATMS contract. The five tenders received were assessed by a tender assessment panel (TAP) comprising 11 experienced engineering and air traffic control personnel of the CAD. The TAP adopted a two-envelope approach, which is a requirement stipulated in the SPR and a government-wide practice. Under this approach, the TAP first conducted a technical assessment of each tenderer's proposal and calculated the technical score. After completion of the technical assessment and obtaining agreement from the Government Logistics Department (GLD), GLD then provided the TAP with the price information of the tender proposals to calculate the price score.

4. For the marking scheme for the ATMS tender exercise, a weighting of 40% for technical score and 60% for price score was adopted. The marking

scheme was developed in accordance with the SPR¹ and approved by the Government Central Tender Board (CTB)², and clearly stipulated in the tender document during the stage of tender invitation.

5. During the preparation of the tender document for the ATC system project in 2008, CAD had explored with GLD on the feasibility of adopting a higher weighting for technical score in the marking scheme, especially for the ATMS contract, but was advised that a higher technical weight would not necessarily ensure a higher quality of the service/product to be delivered by the successful supplier and a value-for-money purchase has to be ensured. GLD also advised that the setting of mandatory requirements and essential requirements under the marking scheme before calculating the technical/price score would instead guarantee that only those capable contractors with quality proposals would be awarded with the contracts. In view of GLD's advice, CAD adopted 40% weighting for technical score and 60% for price score in accordance with the SPR for a value-for-money procurement for the ATMS, which was eventually approved by the CTB.

Technical assessment results

6. A flowchart illustrating detailed flow of the tender assessment process of the ATMS is in **Appendix II**. Tender assessment results for the ATMS contract are summarized in **Appendix III**.

7. After the technical and price evaluation of the tenders by TAP, the tender proposal with the highest score was recommended for consideration and approval by the CTB. Since the ATMS system proposed by Tenderer B in the Appendix III (i.e. the current ATMS contractor) obtained the highest overall score, the contract for the ATMS was recommended to be awarded to Tenderer B, which was subsequently approved by the CTB. A copy of the tender assessment report submitted by GLD to the CTB, recommending the contract of ATMS be awarded to Tenderer B is at **Appendix IV**.

***Note by Clerk, PAC:** *Please see Appendix 13 of this Report for Appendix II, see Appendix 14 of this Report for Appendix IV, and Appendix III not attached*

¹ The SPR stipulates that departments should normally adopt a 30% - 40% weighting for technical score, as against a weight of 60%-70% for price score and departments should note that a higher technical weighting would not necessarily ensure a higher quality of service or goods to be delivered by the successful tenderer.

² The CTB was chaired by the Permanent Secretary for Financial Services and the Treasury (Treasury) and comprised the representatives from the Financial Services and Treasury Bureau (FSTB) and the Government Logistics Department (GLD), etc.

Contract signed with Tenderer B

8. After obtaining the CTB's approval, the ATMS contract was signed between the GLD and Tenderer B in early 2011. A copy of the requested contract documents, including the Tender Proposal, Final Specifications, Conditions of Tender, Conditions of Contract, the Implementation Plan, together with the subsequent Contract Variations, etc. is in **Appendix V**.

(d) and (e) – The ultimate fallback system

9. CAD has specified in the tender document during the preparation of the document in 2009 that the ATMS should consist of three major sub-systems, namely a Main ATMS system, a Fallback ATMS system and an Ultimate Fallback System (UFS). The UFS has been specified in the tender document as a separate system with software and system architecture fully independent from those of the Main ATMS and Fallback ATMS systems. The purpose of including the UFS in the tender document is to mitigate the risk of encountering a total system failure of the ATMS when both the Main and Fallback ATMS systems fail at the same time, thus ensuring flight safety. The requirements for the UFS in the ATMS are on par with similar system setup and best practices adopted in major ATC centres overseas, such as USA, Germany, Norway, etc.

10. CAD has looked into the relevant requirements of the International Civil Aviation Organization (ICAO) and the developments of the ATC systems in the region at that time, and considered that it would be sufficient to set out in the tender document of ATMS that the UFS be equipped with basic ATC functions in the event of failure of the two Main and Fallback ATMS systems.

11. After the award of the ATMS contract to Tenderer B in February 2011, the ICAO further concluded to formulate a Regional Air Traffic Management Contingency Plan in September 2011 to provide a systematic contingency response framework in the Asia-Pacific Region. The framework set out greater details and more concrete guidance to airspace and aerodrome users to facilitate operations under various ATC contingency situations, such as ATC system failure or degradation. In the light of this new ICAO development, CAD had reviewed the system requirements for the UFS in the tender document and the contract of the ATMS, and considered it necessary to enhance such requirements so as to better equip the new ATC system with more enhanced capability to handle contingency situations to ensure flight safety.

***Note by Clerk, PAC:** *Appendix V not attached.*

12. Given the contract with Tenderer B already stated the requirement of having a UFS in place, in order to enhance functions of the UFS system so as to meet the latest ICAO's initiative, CAD considered that it would be justified and more cost-effective to acquire the enhancements through variation of contract instead of conducting a fresh tender exercise. CAD had therefore followed the stipulations in the SPR and sought DoJ's advice (from the WTO GPA perspective) and GLD Tender Board's approval for the contract variation with a view to enhancing the requirements of the UFS.

(f) The tender assessment of the existing ATMS Autotrac 1

13. At present, it is stipulated in the SPR that departments should normally adopt a 30% - 40% weighting for technical score, as against a weight of 60%-70% for price score. There was however no stipulations in regulations laid down by the Government on the weighting for technical score and price score back in 1993 when the existing ATMS (Autotrac 1) was procured. File records show that procurement of the existing ATMS was via an open tender and for the selection of tenderer for the provision of the existing ATMS system in 1993, a two-stage approach was adopted. In the first stage, the assessment panel shortlisted those qualified tenderers for entering the second stage of the tender exercise. The shortlisting criteria included technical and price assessments. For the price assessment, the assessment panel only shortlisted those tenderers with price proposals that were within the estimated project cost. For the proposals meeting project schedule, there was another assessment against eleven selection criteria, two of which were related to pricing with the total weighting for tender price assigned to about 13% of the total assessment score while the other nine selection criteria, including project schedule, system performance, tenderers' ability, etc. accounted for the rest 87%. In the second stage, the shortlisted tenderers could only submit a price not exceeding their previous price proposals submitted in the first stage. The weighting for tender price for second stage of the tender assessment was 8% of the total assessment score, with the other selection criteria, including project schedule, performance of the various systems, tenderers' ability, etc. accounted for the rest of the 92%.

(g) The outstanding deficiencies/observations recorded during the Factory Acceptance Tests and Site Acceptance Tests

14. During the Factory Acceptance Tests (FAT) of the ATMS in June – July 2012, a total of 204 deficiencies/observations were identified and nearly 90% were rectified before the conditional acceptance of the FAT results. Between

August 2012 and June 2013, another 104 deficiencies/observations were identified, which should be addressed during Site Acceptance Test.

15. The deficiencies/observations items identified by CAD during the FAT did not imply that the new ATMS was not functioning properly nor it was unsafe. Given the stringent acceptance tests and the complexity of the new ATMS, it was unavoidable that some deficiencies/observations items were identified. The purpose of the test was to ensure that the ATMS manufactured by the large overseas ATC system supplier could adapt to the local air traffic management environment, and the system could operate safely, stably and reliably.

16. Of the 308 (204 + 104) deficiencies/observations identified, 300 items were related to the aspects of the ATMS under the original contract, and the remaining 8 were enhancement items covered in contract variation 1. A breakdown of the 308 items by their nature is as follows –

Nature of the deficiencies / observations identified during June 2012 to June 2013	Number
Systems Function ¹	121
Human-machine Interface ²	101
Engineering Items ³	86
Total	308

Note (1) System function refers to the data processing related functions.

Note (2) Human Machine Interface (HMI) refers to the user / operator's interface.

Note (3) Engineering item refers to the technical observation.

17. Presently, of the 308 items identified, over 84% have already been rectified, with only 49 items outstanding.

(h) Comparison of the expected and actual implementation plan of the ATC system project

18. A comparison of the expected and actual implementation plan of the ATC system project is provided in **Appendix VI**.

**Civil Aviation Department
December 2014**

***Note by Clerk, PAC:** *Please see Appendices 7 and 8 of this Report for Tables 2 and 1 of Appendix VI respectively.*

Details of systems and facilities for the eight major contracts of the new Air Traffic Control (ATC) system

Eight major contracts of the new ATC system	Details of systems and facilities
(a) Air Traffic Management System (ATMS)	Radar Data Processing and Display System/Flight Data Processing System (RDPDS/FDPS), Radar Data Formatter, Radar Simulator for RDPDS/FDPS and Computer-Based Training (CBT) System
(b) Air Traffic Services Data Management System	Secondary Surveillance Radar Situation Display System, Aeronautical Information Database, Cable/Microwave Link Network and Other Ancillary Systems/Facilities
(c) Aeronautical Information Management System	Aeronautical Information Database
(d) Aeronautical Messaging System	Air Traffic Services (ATS) Message Handling System and Aeronautical Telecommunication Network
(e) Communication Backbone	Master Clock System and Cable/Microwave Link Network
(f) Communications and Recording System	Speech Processing Equipment, Voice Recording/Playback System and ATC Radio Telephony Workload Monitoring System
(g) Relocation and Expansion of ATS Message Handling System	ATS Message Handling System and Aeronautical Telecommunication Network
(h) Ancillary and Technical Support System	Centralised Monitoring and Control System, Telephone System, Un-interruptible Power Supply System and Cable/Microwave Link Network

Table 3 – Contract variations of the ATMS (one of the eight major system contracts of the ATC system project)

	Critical tasks/events	Date
1	Obtained funding approval from the LegCo FC for the Replacement of the ATC System	May 2007
2	Preparation of the tender document for the ATMS contract and approval of the Marking Scheme	May 2007-November 2009
3	Invitation of tenders for the ATMS contract	November 2009 – February 2010
4	Tender assessment for the ATMS contract	March 2010 – February 2011
5	Award of the ATMS contract	February 2011
6	Detailed Design Review Meeting of the ATMS (Item 2 in Table 2 above)	May 2011
7	The 22 nd meeting of the International Civil Aviation Organization (ICAO) Asia-Pacific Air Navigation Planning and Implementation Regional Group At the meeting, the ICAO promulgated a systematic contingency response framework for air traffic management in the Asia-Pacific Region.	September 2011
8	The contractor's submission of Detailed Design Document of the ATMS to CAD for approval (Item 3 in Table 2 above)	December 2011
9	CAD sought GLD's approval for conducting the first contract variation for the ATMS contract. The contract variation mainly sought to enhance the Ultimate Fallback System requirements for the ATMS, as promulgated by the ICAO regarding the systematic contingency response at the meeting held in September 2011 (item 7 above). Opportunity was also taken to incorporate other enhancements to the ATMS, including the enhancements of the missed approach flight procedures and the Air Traffic Services Interfacility Data Communications service, and operational efficiency, etc, which were identified by CAD after the tender exercise of the ATMS.	January 2012
10	GLD approved CAD to conduct the first contract variation	June 2012
11	The ICAO 12th Air Navigation Conference The Conference promulgated enhancements to the air traffic management requirements.	November 2012

	Critical tasks/events	Date
12	<p>CAD sought GLD's approval for conducting the second contract variation for the ATMS contract.</p> <p>The contract variation mainly sought to enhance the air traffic management requirements for the ATMS, according to the Global Air Navigation Plan promulgated by the ICAO at the 12th Air Navigation Conference held in November 2012 (item 11 above). Opportunity was also taken to incorporate other enhancements to the ATMS, including new and enhanced functionalities with human-machine interface after hands-on familiarization training sessions, and the implementation of Performance-based Navigation (PBN) flight procedures, etc, which were identified by CAD after the first contract variation.</p>	June 2013
13	GLD approved CAD to conduct the second contract variation	October 2013

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