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香港特別行政區政府  
The Government of the Hong Kong Special Administrative Region

10 January 2017

Mr Anthony CHU  
Clerk to the Public Accounts Committee  
Legislative Council Complex  
1 Legislative Council Road  
Central  
Hong Kong

Dear Mr Chu,

**Follow-up to Public Accounts Committee Reports No. 63A  
Administration of the air traffic control and related services**

I refer to your letter dated 4 January 2017. Following is a reply from the Civil Aviation Department (CAD) to the issues raised therein:

**(a) Operation of the new Air Traffic Management System (ATMS) upon its full commissioning**

Since its full commissioning on 14 November 2016, the new ATMS of CAD has been operating smoothly over the last two months or so. During the traffic peak of the recent Christmas and New Year season (between 23 December 2016 and 2 January 2017), there was a daily average of 1 142 flight movements at Hong Kong International Airport (HKIA), representing about 1 per cent increase when compared with the average of 1 133 daily flight movements at HKIA over the corresponding period a year earlier. In addition, there was a daily average of 838 overflights, representing an increase of about 13 per cent when compared with a daily average of 739 overflights during the same period a year earlier. The new ATMS (Autotrak III) handled a total of 1 980 flights per day on average, representing an increase of some 6 per cent when compared with 1 872 total flights per day handled over the same period a year earlier and featuring a record number of flights handled during Christmas and New Year period. The flow of traffic was also smooth and orderly.

The temporary occurrence of minor setbacks during the introduction of the new system can be grouped into three main categories, including (1) display issue of aircraft positions on the radar screens of the new ATMS due to the limitations of existing radar technology, which has nothing to do with the design of the new ATMS; (2) two incidents occurred during which the radar screens of the new ATMS were unable to display some of the flight information for 26 seconds and 75 seconds respectively; and (3) some functions of the Electronic Flight Strips (EFS) System installed at the Air Traffic Control (ATC) Tower was temporarily affected.

Concerning (1) limitations of radar technology, it specifically refers to the radar signal interference by external factors and/or moving obstacles or terrain, occasional problems of aircraft transponders etc, affecting the display of aircraft positions on the radar screens. As these phenomena were caused by the limitations of radar technology, they were not peculiar to the new ATMS but were also observed in the ATMSs developed by other manufacturers and in the old ATMS. To overcome the limitations of radar technology, the International Civil Aviation Organization (ICAO) advocates the implementation of the satellite-based “Automatic Dependent Surveillance – Broadcast (ADS-B)” technology in all member states/regions, concurrently with radar technology. CAD has all along been striving to expedite full implementation of ADS-B in the Hong Kong Flight Information Region (HKFIR). In the first phase starting from 14 November 2016, ADS-B was implemented in the southern tips of the HKFIR, where there was no radar coverage. So far, the result was satisfactory. Moving on to the second phase on 8 December 2016, the air traffic control officers (ATCOs) have been able to view the information on flights inside the HKFIR with radar coverage through a separate ADS-B screen next to the radar screen at the same working position. In other words, ATCOs can now obtain relevant flight information simultaneously through radar screens and ADS-B screens. In addition, CAD is going to implement ADS-B in the HKFIR in full by the end of this year.

For (2) the two incidents occurred during which the radar screens of the new ATMS were unable to display some of the flight information, CAD has taken prompt follow-up actions, including tasking the ATMS contractor (Raytheon) to optimise operating procedures and system software. Specifically, the two incidents took place because the Flight Data Processor (FDP) did not process the flight plan association with radar data immediately. Hence, some of the flight information was not displayed on the radar screens. The first incident occurred when the number one FDP (FDP#1) of the Main System encountered a file access anomaly while trying to access certain archived playback data. The system initiated an auto-switchover to the Main System’s number two FDP (FDP#2) as per design. During the auto-switchover, all the radar and flight information was displayed at radar screens in a continuous and seamless manner. After confirming the normal operation of the FDP#1, the technical staff then restarted the FDP#1 in accordance with the established procedures to make it serve as the standby FDP. During this process, the two FDPs started to synchronise flight information. The data synchronisation process took priority and the flight plan association process was expected to take place shortly afterwards, resulting in the momentary flight plan dis-association. To prevent the FDP switchover from conducting playback as an expedient measure, playback sessions will be conducted on the Fallback System to avoid impacting the Main System operation. If a switchover is needed from the FDP#1 to the FDP#2, the technical staff will avoid carrying out the FDP synchronisation process during a high traffic period. In the long run, CAD will prevent the unnecessary auto-switchover of the FDP through optimising system software to strengthen monitoring and management of playback sessions. The second incident was caused by a similar reason. The technical staff concerned retrieved and archived data from the Main System when carrying out system maintenance, failing to follow the recommended procedures promulgated by the department earlier. Likewise, the data retrieving and archiving process took priority and the flight plan association process was expected to take place shortly afterwards. As the flight plan association process was not carried out in time, there was momentary flight plan dis-association. To avoid this from happening again, as an expedient measure, data should not be retrieved and archived from the Main System. The long term solution is identical to that of the first incident. CAD will optimise system software. When the FDPs carry out data synchronisation, the established associations between targets and flight plans would be protected to ensure that flight plan association will not be affected.

The optimised system software, which will prevent the same situation from happening again, is now being tested by CAD and the contractor in accordance with ICAO's safety management process.

With respect to (3) a temporary anomaly with the EFS System, it has been in operation in the ATC Tower since 2012 when the old ATMS was in use. The supplier was Frequentis. Since commissioning of the new ATMS, the EFS System was integrated into the new ATMS as a sub-system. The EFS could have some issues occasionally, no matter when it operated independently in the past or after it was integrated into the new ATMS. CAD and the contractor are examining the root cause of the occurrence and the appropriate follow-up action. For phenomena (2) and (3), the Transport and Housing Bureau (THB) has sought expert advice from the overseas independent consultant, the United Kingdom-based National Air Traffic Services (NATS).

CAD has been adhering to the principle of openness in proactively disclosing occurrences in relation to the operation of the new ATMS. We have, in two information papers dated 28 November 2016 and 13 December 2016 (please see [Annex A](#)), informed the Legislative Council Panel on Economic Development (ED Panel) about the operation of the new ATMS from its full commissioning up till 29 November 2016. Letters and public statements in support of the launching of the new ATMS by CAD, made by the Hong Kong Air Traffic Control Association (HKATCA), CAD Electronic Engineers' Branch of Hong Kong Chinese Civil Servants' Association, the Board of Airline Representatives Hong Kong, which represents more than 70 airlines, and two local airlines are appended to the document. CAD has also issued press releases proactively to make known to the public the occurrences which took place after 29 November. Relevant press releases are at [Annex B](#).

NATS, appointed by THB, has already confirmed that the new ATMS engineering was safe, stable and reliable. According to NATS, given the complexity of an ATMS, even with all reasonable efforts and endeavors, there could still be possibilities of setbacks during the introduction of a new system. It needs some time to optimise its performance and suit the local operating environment. The ATMS expert panel set up by CAD (described below) agreed that the optimisation process is inevitable and understandable. The multiple layers of fallback systems have not been activated since the new ATMS was fully commissioned. Any ATMS, regardless of the manufacturer, would encounter these kinds of occurrences and there have been similar experiences overseas. The most important point is that CAD has established an effective mechanism to cope with different situations. Concerning this point, the expert panel unanimously considered that CAD's mechanism for responding to different situations during the teething period was on a par with international practice.

**(b) Peak air traffic preparedness solution**

The daily flight movements at HKIA and the number of overflights, which do not take off or land at HKIA, during the last Christmas and New Year holidays were both higher than the corresponding period a year earlier. As in the past, CAD has deployed additional staff and operated the new ATMS to maintain an orderly and expeditious flow of air traffic during the peak season. The total number of flights handled during this Christmas and New Year period also set a record level. To cope with the peak air traffic during the coming Lunar New Year, CAD will deploy additional staff on one hand, and on the other, CAD will implement when necessary the "air traffic flow management measures" (flow control) as in previous years to reduce the number of overflights entering the HKFIR, so as to ensure safe and orderly air traffic operation within its

**\*Note by Clerk, PAC:** *Please refer to LC Paper No. CB(4)154/16-17(04) on LegCo Website for Annex A, and news.gov.hk for Annex B.*

airspace. Implementation of flow control is a common practice adopted worldwide for ATC to manage air traffic and is not related to the performance of the new ATMS. Please refer to a press release at [Annex C](#) for details.

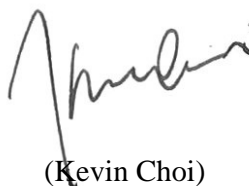
**(c) First meeting of the ATMS expert panel**

CAD set up a five-member expert panel which includes Professor Man Hau-Chung, Dean of Engineering of the Hong Kong Polytechnic University; Mr Albert Lam, former Director-General of Civil Aviation; Mr Warren Chim, Deputy Chairman of the Hong Kong Institution of Engineers' Aircraft Division; Mr Marc Houalla, the President of the National School of Civil Aviation in France; and Mr Huah Kong Beng, the Chairman of ICAO Asia & Pacific Regions Air Traffic Management sub-group. Within a year after the full commissioning of the new ATMS, the expert panel (appointed till 30 November 2017) will provide objective expert advice to the DGCA on teething issues arising from the commissioning of the new ATMS and the necessary optimisation work; and to share with CAD international experience and best practices in relation to the long-term optimisation of new ATMS.

The expert panel held its first meeting on 16 December 2016. CAD briefed expert panel on the design and functionality of the new ATMS, preparation for the transition of the system, operations since its commissioning, issues encountered and the solutions. The expert panel has set out the work plan in the coming year and planned to meet with different stakeholders to gauge their views on the optimisation process of the new ATMS. Please refer to [Annex D](#) for a press release and a gist of remarks made by the DGCA (Chinese only) at a media session after the first meeting. The expert panel plans to hold the second meeting and to meet with the ATCOs and Electronic Engineers to gauge their views within this month. It is expected that the expert panel will make a preliminary report in the coming March or April.

ED Panel discussed matters on the new ATMS on 13 December 2016. To help members better understand the operation of the system, CAD is organising a visit to CAD for the ED Panel members tentatively in the afternoon of 19 January. Members of the Public Accounts Committee are cordially invited to join the visit. We look forward to receiving your favourable reply.

Yours sincerely,



(Kevin Choi)  
for Director-General of Civil Aviation

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**\*Note by Clerk, PAC: Please refer to news.gov.hk for Annexes C and D.**