



*International Civil Aviation Organization*

**SIXTEENTH MEETING OF THE  
COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND  
METEOROLOGY SUB-GROUP (CNS/MET SG/16) OF APANPIRG**

Bangkok, Thailand, 23 – 27 July 2012

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**Agenda Item 3: Aeronautical Fixed Service (AFS)**

3) discuss AIDC ICD issue and other AFS related issues

**Agenda Item 6: Surveillance**

3) discuss other surveillance related issues

**A NEW CHAPTER OF AIR TRAFFIC CONTROL CENTRE (ATCC)  
IN HONG KONG, CHINA**

(Presented by Hong Kong, China)

**SUMMARY**

In order to cope with the growing air traffic demand in the Asia and Pacific (APAC) Regions for the coming decades, a new Air Traffic Control Centre (ATCC) which is close to 2 times of the existing one is being built at the Hong Kong International Airport (HKIA) to accommodate a set of new and advanced Air Traffic Management (ATM) systems with interfaces and connectivity to various communications and surveillance systems. The design theme of the New ATCC encompasses three main elements, namely Sustainable, Environmental friendly and Educational to form the concept “SEED”. This working paper shares with the States the SEED concept and a three-phase approach adopted in modernising the ATM Systems to meet the ICAO ASBU and seamless sky initiatives.

This paper relates to –

**Strategic Objectives:**

*A: Safety – Enhance global civil aviation safety*

*C: Environmental Protection and Sustainable Development of Air Transport – Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

**Global Plan Initiatives:** All except those related to navigation

**1. Introduction**

1.1 The air traffic growth at the Hong Kong International Airport (HKIA) has been maintained steadily since its opening in 1998, except for the years 2003 and 2008 whence the aviation business was affected by the occurrence of Severe Acute Respiratory Syndrome (SARS) and

economic downturns. According to the Hong Kong Airport Authority, the annual air traffic movements increased from 163,200 in 2008 to 334,000 in 2011, and are expected to reach 602,000 by year 2030.

1.2 In order to cope with the expected demand and meet the technological development of aviation systems, the Hong Kong Civil Aviation Department (HKCAD) successfully obtained funding in 2007-2008 to replace the existing air traffic management (ATM) systems as well as to build a new Headquarters on the airport island to house the new air traffic control centre (ATCC) and offices to accommodate all the functional Divisions of HKCAD under one roof. The new Headquarters also include auditorium, education path, and accident investigation facilities.

1.3 Construction of the New CAD Headquarters Building was completed in June 2012, and installation and testing of new ATM systems are in good progress. Subject to satisfactory completion of various acceptance and integration testing, controller training on the new equipment, procedure evaluation, safety risk assessment, contingency and transition planning and drills, the new ATCC will be put into operations the earliest in end 2013.

## **2. Discussion**

### New ATCC

2.1 In designing the new ATCC and other operational facilities such as Aeronautical Information Management Centre (AIMC), the concept of “SEED”, viz “Sustainable”, Environmental friendly” and “EDucational” are factored in as described below: -

- (a) Sustainable – The size of the new ATCC is close to 2 times of the existing ATCC which is big enough to accommodate 40 plus Controller Working Positions (CWP) to cope with the projected traffic demand up to year 2025 and beyond. Besides, an expansion area is reserved next to the new ATCC to cater for future expansion and in-situ replacement of console and equipment.
- (b) Environmental friendly – Various energy saving measures are adopted in the new ATCC, such as blending of natural lighting with the long-life energy efficient LED to form the ambient light in the New ATCC. Enhanced air-conditioning system with separate monitoring and control of cooling respectively for equipment and staff working in the centre. A window is also provided at the new ATCC for use of natural lighting and improving awareness of the weather situation at the airport.
- (c) Educational – Spanned across the whole New CAD Headquarters Building, an Education Path with exhibits on aviation information that terminates at the viewing gallery of the New ATCC would allow aviation partners and general public to appreciate the daily operations of Hong Kong ATC.

### Modernisation of ATM Systems

2.2 Implementation of the new ATM systems is being carried out in 3 phases, namely, Concept and Design, Implementation and Transition, and Post-implementation Review. Fact-finding visits to modern ATCCs of other air navigation services providers (ANSP) were arranged during the Concept and Design Phase so that the project team could keep abreast of the latest experience in the design and introduction of new ATM systems in the world. Moreover, ATM system manufacturers

were asked to present and demonstrate their state-of-the-art systems which equipped with latest technology.

2.3 In order to acquire a good mix of ATM equipment, instead of adopting a turnkey approach, HKCAD procured the new equipment and simulators through multiple open tenders each containing a bundle of systems of commonality and connectivity. Highlights of the advanced technologies and systems to be equipped for the new ATCC are given below: -

- (a) Air Traffic Management System – This is the brain and core of the ATM systems that provide air situation and flight planning information for controllers. It supports fusion of surveillance sources like radar, ADS-B, MLAT; integrated AIDC and arrival manager functions; ADS-C/CPDLC and Mode S datalink capability; enhanced safety net (e.g. STCA, MSAW, APM, MTCDD); electronic strips operation, etc.
- (b) Aeronautical Information Management System (AIMS) – To cope with the ICAO ASBU initiatives for transition from AIS to AIM, the AIMS shall initially be compliant with AIXM version 4.5 and subsequently be migrated to version 5.1. AIMS shall support e-AIP, e-NOTAM, electronic pilot briefing, etc.
- (c) ATS Data Management System (ATSDMS) – This system provides a platform for capturing real time ATS data from other systems to support collaborative decision making among aviation stakeholders and to serve as a management tool for situation awareness and analysis purposes. The ATSDMS also provides integrated operational displays at the aerodrome control tower and new ATCC to streamline display of ATC-related information for controllers.
- (d) ATN/AMHS – Hong Kong, China as the backbone site in the APAC Regions, will fully support dual-stack ATN/AMHS operations with neighbouring authorities.
- (e) Communications Backbone Network – This network integrates high capacity microwave links with high speed fibre optic synchronous digital hierarchy (SDH) equipment to form a highly resilient communications network linking the new ATCC and aerodrome control tower with HKCAD's communications, surveillance and navigation sites for secure and uninterrupted operations.

2.4 In preparing the specifications for the ATM systems, it is important to specify clearly the operational concept, mandatory or essential requirements, interface requirements with adjacent ANSPs, flexibility for system upgrading and expansion, etc. Detail Design Review (DDR) is a very important process after contract award to iron out the exact and detailed system design and installation requirements before the contractors proceed with equipment production in their factories.

2.5 For the Implementation and Transition Phase, the HKCAD devised very stringent acceptance testing requirements for factory, site and reliability acceptance tests as well as system integration tests when individual systems are ready. HKCAD is now in the midst of factory acceptance testing work and system integration testing is planned for completion around mid-2013. Interoperability tests like AIDC with other ANSPs are planned for 2013.

2.6 Upon commissioning the new ATM systems and transition to the new ATCC, Hong Kong, China stands ready to support implementation of relevant modules under the Aviation System Block Upgrades (ASBU) and seamless sky initiatives as well as air traffic growth at the HKIA and the APAC Regions.

**3. Action by the Meeting**

3.1 The meeting is invited to:

- a) note the ATM modernisation plan of Hong Kong, China in support of ASBU and seamless sky initiatives and air traffic growth at the HKIA and the APAC Regions;
- b) support the regional ATM modernisation program to realise seamless sky; and
- c) facilitate regional harmonisation of system inter-operability such as AIDC, ATN/AMHS, etc. for realisation of increased operational efficiency and enhanced flight safety in the APAC Regions.

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