

Combined ASIOACG/9 and INSPIRE/5 Meeting, 2014

Dubai, UAE, 12th to 14th November 2014

Agenda Item 3: Air Traffic Flow Management**Indian Central-Air Traffic Flow Management**

(Airports Authority of India)

SUMMARY

This paper presents an overview of India's ambitious project to implement Central-Air Traffic Flow Management to improve operational efficiency of flights in Indian airspace. At Delhi Airport A-CDM is already operational. The A-CDM is ready for testing at Mumbai Airport. The C-ATFM, when operational will be able to integrate various subsystems for collaborative decision making and to ensure regulated flow of traffic to minimize delays and congestion. The implementation of C-ATFM is India's initiative to manage demand and capacity while ensuring safety and measurable gains in efficiency of flight operations in terms of on time performance and reduced delays and carbon emissions.

1. INTRODUCTION

- 1.1 India has witnessed a sustained growth of air traffic during the last decade and this trend is likely to continue in the coming ten to fifteen years. Continued aggressive demand for access to major airports is expected to continue in the near future. This increase in demand requires a corresponding effort to augment and utilize system capacity efficiently.
- 1.2 The augmentation of capacity both at airports and in airspace requires long term investments and efforts. Therefore optimum and efficient utilization of available capacity should be the top priority of ANS providers. A network wide view provided by effective Air Traffic Flow Management (ATFM) capabilities for Demand and Capacity Balancing (DCB) across the national airspace system is the preferred mechanism for efficient ATM services. The ATFM tools will enable improved management of demand and capacity, and will help system stakeholders to deal with the increased complexity of the nation's air routes.

- 1.3 India has accordingly decided to implement Central ATFM (C-ATFM) system covering entire Indian airspace which will integrate various subsystems for collaborative decision making and to ensure regulated flow of traffic to minimize delays and congestion.
- 1.4 While ATFM is proven to enhance safety and provide measurable efficiency gains, it is also viewed as a transformational concept that introduces new levels of collaborative decision making and offers potential for harmonizing seamless airspace operations.
- 1.5 Effective implementation of ATFM requires the active participation of all affected stakeholders. ATFM should be performed as a collaborative decision making process, where airports, ANSPs and airspace users work together to improve the performance of the network.

2. DISCUSSION

2.1 Indian C-ATFM (Central –ATFM) Concept

- 2.1.1 The C-ATFM System would provide ANSP and Aircraft Operators with a decision support capability to safely, efficiently, and predictably manage demand when it exceeds capacity at constrained resources such as airports, airspace sectors etc., within the Indian airspace. Capacity/Demand imbalances can be identified and addressed in the Strategic, Pre-Tactical, and Tactical phases of ATFM. The C-ATFM system will be progressively implemented in three stages as follows.
- 2.1.2 **Phase 1:** The C-ATFM baseline system would be in place by end of 2015. This would provide AAI and Aircraft Operator users with significant capabilities to perform strategic, pre-tactical, and tactical ATFM and CDM. The C-ATFM system will consist of a Central Command and Control Center (CCC) at Delhi networked with Traffic Management Units (TMU) at six major airports. The six airports are Delhi, Mumbai, Bangalore, Chennai, Kolkata and Hyderabad. The CCC will be the nodal center for ATFM implementation in India and will be provided with strategic and tactical flight plan data, weather data, airport and airspace capacity data and other relevant environmental data necessary for monitoring demand and capacity across Indian airspace. The CCC will in turn communicate with TMU for ATFM measures implementation as and when necessary.
- 2.1.3 **Phase 2:** Nationwide ATFM system covering airports throughout India will be made gradually operational by end of 2016. The future functionality of the ATFM system would depend on needs of Indian airspace users and advances in ATFM

technology and system. The evolution of the system will complement the basic ATFM system from Stage 1.

- 2.1.4 **Phase 3:** The Indian C-ATFM system will have capabilities to expand as a sub-regional/regional ATFM system. The system will also have scope for interfaces for seamless data exchange with other ATFM systems in the sub-region and region, thus supporting evolution of an international ATFM system. The specific functionality will be developed in collaboration with the States/ANSPs coming together for international ATFM integration.

2.2 Key Features for a successful ATFM implementation

- 2.2.1 The application of the ATFM concept involves collaborative decision-making (CDM), the definition of processes for demand-capacity balancing within the context of air traffic control (ATC), aerodrome operations, airspace design and management and developing close collaboration between the Civil and Military ,providing for a flexible use of airspace (FUA). An adaptive regulatory environment plays a key role in the development of a mature ATFM system.
- 2.2.2 **Collaborative Participation** –A key part of the future ATFM concept is Collaborative Decision Making (CDM) which helps ATC achieve its goal of managing the ATC system and the operators achieve their goal of managing their schedules. The result of CDM is a shared situational awareness and collaborative resolutions for “win-win” solutions for both ATC and stakeholders. Collaboration leads to enhanced options, resulting in improved decision making, stakeholder acceptance and support, and increase service performance.
- 2.2.3 **Flexible Use of Airspace** - The civil and military are the prime users of the national airspace which is a finite asset and under the existing system the airspace is used by both in isolation from each other. However, with increased demand from both military and civil aviation sector of the available airspace needs to be effectively optimized to enhance the airspace capacity and to facilitate the demands of both the sectors. The active promotion of the Flexible Use of Airspace (FUA) in the country’s airspace is a pre requisite to a successful ATFM system operation.
- 2.2.4 **Airspace Management** – The ANSP manages an efficient airspace management processes to accommodate dynamic flight trajectories and provide optimum system solutions. Airspace use will be need to be coordinated and monitored in order to accommodate the conflicting legitimate requirement. Active involvement of regulator, ANSP and the military can result into dynamic air space management which can be planned in advance with changes made dynamically whenever possible. The system can also accommodate unplanned requirements such as contingencies.

- 2.2.5 ATFM Personnel** - The implementation of ATFM is a process of CDM involving properly trained ATFM Personnel. Hence it is of paramount importance that the ATFM Personnel selected should be adequately trained in the use of ATFM system, tools, procedures and regulations. The ATFM implementation process calls for a network wide view and therefore the ATFM personnel should preferably be highly experienced ATC personnel. The other stakeholders should also be properly trained in the ATFM procedures for
- 2.2.6 Progressing to a trans-national ATFM system** - The ATFM system develops initially to balance inequalities of demand and capacity at certain points in the ATM system and is local in scope. It should however be recognised that due to the global nature of aviation, the ATFM system will eventually develop to encompass a larger airspace across many States. India foresees an international ATFM system that optimizes available capacity on a sub-regional basis. It will enable States/ANSP to share information and collaborate with neighbours facilitating efficient regional traffic flow. A proactive regulatory framework reaching across the national boundaries, therefore, is necessary for harmonized implementation of a trans-national and seamless ATFM system.

3. ACTION BY THE MEETING

- 3.1. The meeting is invited to note the information contained in this paper.