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**ASSEMBLY — 36TH SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 31: Continued evolution of a performance-based global air traffic management (ATM) system**

**IMPLEMENTATION OF PERFORMANCE-BASED NAVIGATION SYSTEM PROCEDURES - CAPACITY ENHANCEMENT INITIATIVES AT MUMBAI AND DELHI AIRPORTS**

(Presented by India)

**EXECUTIVE SUMMARY**

This paper provides an update on the initiatives taken by India to enhance the airport/airspace capacity at two major airports in India i.e. Mumbai and Delhi. It also provides an update on the initiatives taken to implement PBN procedures in India to improve the capacity and efficiency in ATM system at Mumbai and Delhi and subsequently at all other airports. The Assembly is invited to take note of the initiatives taken by India to enhance the capacity and efficiency in ATM.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective A: Safety – <i>Enhance Global Civil Aviation Safety.</i>
<i>Financial implications:</i>	N/A
<i>References:</i>	

## 1. INTRODUCTION

1.1 Mumbai and Delhi are two major airports in India which account for about 40-50 per cent of the total air traffic in India.

1.2 Due to sudden and unprecedented traffic growth, the traffic has increased double fold in the recent past and is showing further growth. Daily average movement at Delhi Airport which was about 300 in the year 2002-03 has increased to 650 in 2006-07 and at Mumbai the average daily movement which was about 350 in the year 2002-03 has increased to 670 in 2006-07.

1.3 The ground infrastructure at Mumbai and Delhi has been upgraded to meet the growing demand. Since Delhi and Mumbai Airports are focal points of air traffic growth, the traffic congestion result delays to aircraft operations. In order to cope up with this phenomenal rate of growth and to enhance the handling capacity and minimize delays at these airports, following interim measures have been implemented.

- a) To facilitate the aircraft to obtain clearances up to 30 minutes prior to start up a dedicated channel for clearance delivery has been implemented at Mumbai and Delhi Airports;
- b) To make optimum use of near parallel runways at Delhi and cross runways at Mumbai, procedures were developed and implemented to carry out simultaneous dependent operations; and
- c) To minimize the runway occupancy time and to enhance the capacity, inter-section departure procedure for Mumbai and Delhi Airports have been notified.

This has resulted in significant improvement in the runway capacity and also minimized ground delays and holding delays in the air.

## 2. IMPLEMENTATION OF PBN PROCEDURES

2.1 Further to the above, in compliance with ICAO recommendations, and to meet the current and future air traffic needs, India has decided to implement performance-based navigation (PBN) procedures at both Mumbai and Delhi Airports on priority, which will further be extended to other Indian airports in a phased manner.

2.2 Airports Authority of India (AAI) and M/s MITRE Corp., of USA have entered into an agreement, to implement system improvements required to maximize efficiency and capacity. These improvements will include modifications to terminal and en route airspace, increased use of area navigation (RNAV) and required navigation performance (RNP) capabilities, and revised air traffic control procedures.

2.3 The project proposal has two primary objectives. The first objective is to assess the immediate airspace and procedure development needs at three airports critical to India's overall air traffic system. These are Delhi Mumbai and Ahmedabad. The second objective is technology transfer and training to Indian experts.

Through the implementation of PBN procedures the following objectives are expected to be achieved:

- a) Improved ATC procedures;
- b) Improved Controller efficiency and Safety level;
- c) Capacity enhancement;
- d) Improved airport access; and
- e) Environmental benefits and noise abatement

2.4 A sequence of workshops and training will also be organized as part of the project to create awareness and disseminate knowledge amongst various stakeholders on PBN concepts, procedures and advantages. India is also hosting an ICAO seminar and workshop on PBN at Delhi in September 2007.

### 3. PROJECT STUDY

3.1 The study will include various alternatives to address the increasing demand at the airports in Delhi and Mumbai. The main tasks are as given below.

- a) Validation of current runway capacity at the airports in Delhi and Mumbai, including projection of future demand and identification of required airspace capacity under various future scenarios;
- b) Identification and recommendations of airspace design alternatives that provide increased capacity to meet the demand for the scenarios identified during the capacity analysis;
- c) Design and implementation of RNAV arrival and departure procedures that minimize noise impacts and improve efficiency based on the selected airspace design alternative; and
- d) The procedure design will also take into consideration the requirements of environmental protection, reduction in aviation emissions, noise abatement, uninterrupted continuous descent profile to the arriving aircraft, etc.

4. **PROJECT SCHEDULE**

4.1 The project is scheduled to be completed by end of May 2008 and the procedures are expected to be implemented in June 2008.

4.2 On successful completion of the project and training of AAI specialist, RNAV/RNP procedures for other airports will be developed by AAI specialists.

5. **CONCLUSION**

5.1 The Assembly is invited to take note of the Indian initiatives to augment airport/airspace capacity and progress on the implementation of PBN procedures

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