



## INTERNATIONAL CIVIL AVIATION ORGANIZATION

**TWENTY FIFTH MEETING OF THE  
ASIA/PACIFIC AIR NAVIGATION PLANNING AND  
IMPLEMENTATION REGIONAL GROUP (APANPIRG/25)**

*Kuala Lumpur, Malaysia, 8 – 11 September 2014*

**Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation**
**3.2: ATM**
**IMPLEMENTATION OF PBN BASED RNAV 1 (GNSS) SID AND STAR AT GOA AIRPORT**

(Presented by India)

**SUMMARY**

In the spirit of Civil-Military cooperation towards efficient air traffic flow management at common use military airports, PBN based RNAV 1 (GNSS) SID and STAR procedures have been developed at Dabolim Airport, Goa, an important Naval Air Base. This paper provides information on the how the joint effort of Indian Navy and Airports Authority of India made it possible to develop and plan the implementation of RNAV-1 SID & STAR procedures at this airport.

***Strategic Objectives:***

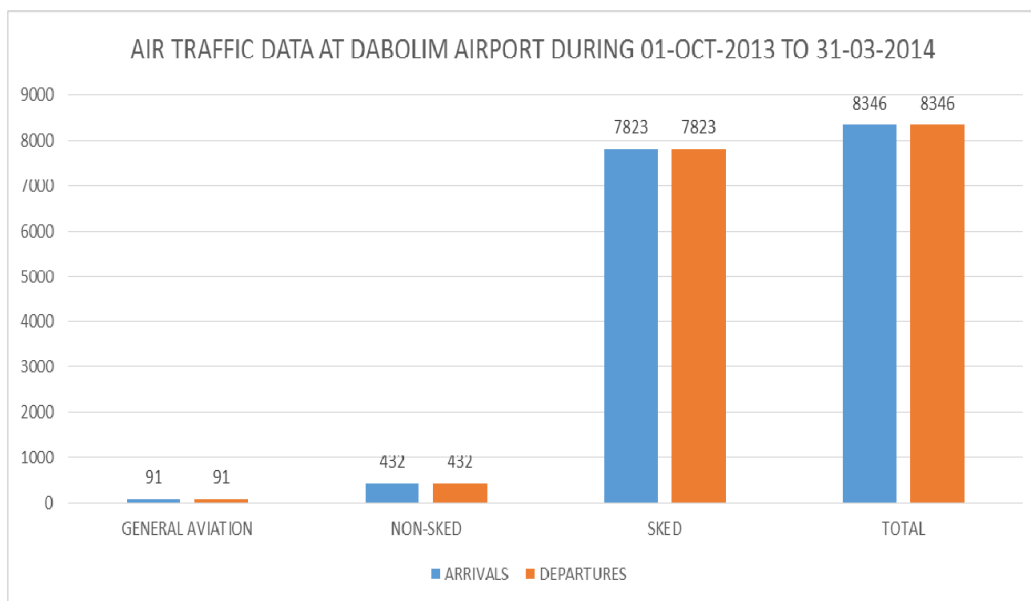
- A: ***Safety*** – Enhance global civil aviation safety
- B: ***Air Navigation Capacity and Efficiency***—Increase the capacity and improve the efficiency of the global aviation system
- E: ***Environmental Protection*** — minimize the adverse environment effects of civil aviation activities.

**1. INTRODUCTION**

1.1 There are many common use airports in India where scheduled civil and military operations take place simultaneously or in time-segregated modes. Over the years there has been significant growth of civil air traffic at these airports. Demand for use of airspace by both civil and military users many times leads to delays and holdings. Recognizing the need for a mechanism that could permit efficient utilization of airspace at defense airport, implementation of Performance Based Navigation Procedures was initiated by Airports Authority of India.

1.2 Having successfully implemented PBN based SIDs & STARs at major airports and RNAV 5 routes in en route phase, AAI has acquired expertise and capability in PBN procedure Design. Further, during PBN implementation, AAI had all along included defense authorities as a stakeholder, thereby facilitating knowledge and information sharing in respect of PBN and the benefits accruing from its implementation. Goa Airport, considering its traffic potential, is a definite candidate for PBN implementation.

1.3 Traffic Data for civil flight for 6 months indicates that out of total 16992 flights (8346 arrival and 8346 departures), 7823 arrival and 7823 departures were scheduled flights including international charter flights, most of which would be benefitted with the implementation of PBN procedures at Dabolim Airport, Goa.



The number of flights benefitted with the implementation PBN procedures at Dabolim Airport will increase significantly, if Indian Navy considers PBN operational approval for their aircrafts.

1.4 AAI's proposal to defense authorities intended to capitalize on the accuracy, predictability and repeatability of PBN trajectories to manage arrivals and departures so as to use limited airspace for this purpose, thereby permitting simultaneous segregated military operations, if required, in the remaining airspace. The design, development and implementation of the PBN procedures at defense airports will be a collaborative effort.

## 2. DISCUSSION

2.1 Recognizing the benefits of PBN implementation, Indian Navy accepted the proposal and mutually Dabolim airport, Goa has been chosen for PBN implementation. Apart from being a major naval air base, the city is also a major tourist attraction promoting both domestic and international air traffic to the airport.

2.2 PBN Implementation Project at Dabolim airport commenced with a conduct of PBN seminar involving all stake holders. Thereafter detailed consultation with Navy resulted in the development of common airspace concept where in airspace constraints, availability of navigation infrastructure, modes of civil-military operation were assessed. To overcome the constraints identified during the discussions required delegating airspace to Dabolim ATC, fixed trajectories for the management of arrival/departure flows thereby facilitating conflict resolution and enhancement in safety, avoid delays to arrivals, through flow management from adjoining control centers, permitting simultaneous civil and military operations in segregated airspace. This analysis resulted in the collaborative development of concept PBN procedures for promoting Continuous Climb Operations/Continuous Descent Operations.

2.3 Establishment of structured arrival and departure flows not only results in conflict resolution but facilitates in sequencing arrivals to reduce delays. Track-miles reduction and optimized trajectories lead to fuel savings and emission reduction. All these are achieved with reduction in controller workload.

2.4 Due to accurate and predictable trajectories of aircraft carrying out PBN procedure, management of military movements is facilitated, thereby promoting efficiency of the airspace from military perspective. In light of the benefits that are accruable due to PBN procedures, Indian Navy envisages collaborative implementation of PBN procedures at other common use naval airports.

2.5 In order to support the PBN implementation at Dabolim airport, AAI will undertake to complete following other tasks-

- PBN Training (Classroom & simulator) of the Indian Navy Air Traffic Controllers
- Validation and Safety Assessment
- Regulatory approvals
- Implementation of the procedures
- Post implementation review

### **3. ACTION BY THE MEETING**

3.1 The Meeting is invited to:

- Note the information contained in this paper;
- Note India's ANS initiative in fostering Civil-Military cooperation using collaborative approach; and
- States may consider similar approach in improving Civil-Military Cooperation and enhancing service levels.

— END —