ATFM IMPLEMENTATION IN INDIA

–

PROGRESS THROUGH COLLABORATION

PRESENTED BY-
AIRPORTS AUTHORITY OF INDIA
CONTENTS

1. India – Civil Aviation Scenario
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Total airspace: 2.8 million Sq.NM (9.5 M Sq.Km)

Oceanic: 1.74 million Sq.Nm (Bay of Bengal, Arabian Sea & Indian Ocean)

Continental: 1.04 million Sq.NM

4 FIRs: Kolkata, Delhi, Mumbai, Chennai

Sub FIR: Guwahati
• Vital link between East-South East Asia And Europe& Beyond
• 14 neighboring FIRs
• Air Traffic Routes: International – 93, Domestic – 178
• NEIGHBORING STATES 12
• AIRPORTS 125
• ACCS 13
• TOWER/APPROACH 59
• MOVEMENTS 1.86 MILLION (ANNUAL)
• ANS WORK FORCE 4700
GROWTH OF INDIAN AVIATION

- 40 Million passengers in 2000
- 60 Million Passengers, 50 Operational Airports in 2005
- 123 million Passengers, 82 Operational Airports in 2010
- 160 million passengers, 4th Largest Domestic Aviation Market in 2013
• To ensure safety and efficiency of air traffic through airspace with least average delay to users.
• Achieved through Capacity and Efficiency enhancements Initiatives
KEY ANS SOLUTIONS

Airspace
- PBN implementation
- Airspace restructuring
- ATM automation
- ATS route realignment
- Conditional ATS route
- Reduction in separation
- Continuous Descent Ops

Airport
- Taxiways
- Better final approach aids
- Departure Slot Management
- Final approach spacing
- ARR/DEP ROT Reduction
- Infrastructure provision

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FOCUSSED ANS INITIATIVES

- PBN
- Airspace and Route optimization
- Nationwide Surveillance Coverage
- Upper Airspace harmonization
- ATM Automation
- FUA
- GAGAN (SBAS), GBAS
- FTI
- ATFM
Overlapping and redundant Surveillance

Harmonized Upper Airspace

ATC Automation:
at all Major/ Medium-density Airports

PBN – Enroute/Terminal

Integrated ATS Simulators at Delhi, Mumbai, Chennai and Kolkata
NEED FOR ATFM

WHY DO WE NEED ATFM?

• Finite Resources – Airport, Airspace
• Ever increasing growth – Increasing Demand for access
• Contingencies – Unexpected decrease in capacity (weather, emergencies)
• Saturation of Capacity
• Need for balancing Demand and Capacity for “PLANNED” optimum utilization of resources
ATFM IMPLEMENTATION - TRIGGERS

- Mature ANS Environment – Automation, PBN
- Mature Civil – Military Coordination - FUA
- Developing Modern Airport Systems – Infrastructure, A-CDM
- Planning for a major event
- Stakeholders realization of the benefits of ATFM – Optimum Resource Management
- Progressive Regulatory Environment – Enabler
ATFM AND TACTICAL DECISION TOOLS

- ATFM operates over the full spectrum of operational time phases
- As the operation approaches, the accuracy of flight data improves
- Tactical Decision Support Tools (e.g., A-CDM, DMAN, AMAN) operate in a time horizon closer to the operation

![Diagram showing the relationship between STRATEGIC, PRE-TACTICAL, TACTICAL, ATFM CDM, A-CDM, AMAN, DMAN, information sharing, pre-departure sequencing, variable taxi times, arrival sequencing, spacing, and runway allocation, and demand capacity management / CDM.]

10/24/2014 ATFM WORKSHOP - BEIJING 2014
• Objective is to manage and optimize traffic flows by *actively collaborating with airlines, airport, defense and other stakeholders* on daily basis.

• The Central Command Center (CCC) will receive strategic and tactical FPL, Weather, Airspace, Traffic, Airport information for accurate Situational Awareness

• Traffic Management Unit (TMU) will be the unit implementing ATFM program
C-ATFM Architecture

Airlines
Airports
Met
ATC
Military

External systems

C-ATFM

TMU

FPL data

ATFM Portal
CDM Portal
TMU / TWR Web Client
INTEGRATED ATFM & CDM - FUNCTIONAL FLOW

COMMON SITUATIONAL AWARENESS

SPECIFY CAPACITY

PREDICT DEMAND

MONITOR DEMAND AND CAPACITY

EVALUATE ALTERNATE TMI

PERFORM CDM

INITIATE OR MODIFY TMI

PERFORM CDM

SPECIFY CAPACITY

PREDICT DEMAND

MONITOR DEMAND AND CAPACITY

EVALUATE ALTERNATE TMI

INITIATE OR MODIFY TMI

OPERATIONAL ANALYSIS (REAL TIME AND POST)

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ATFM WORKSHOP - BEIJING 2014
• Integrated ATFM/CDM (connectivity and data exchange between all participating systems)
• Strategic to Tactical ATFM by focusing on
  – Weather
  – Airspace management
  – Airline operational requirements
  – Airport constraints – departure and arrival airport
  – Terminal Airspace constraints (CCO and CDO)
  – En-route constraints
• Demand and Capacity Balancing (Traffic Management Initiatives at departure and arrival airport and En-route airspace)
• Robust Post Operation Analysis
- CCC at Delhi
- TMU (Traffic Management Units) at Mumbai, Delhi, Kolkata, Chennai, Bangalore and Hyderabad
- Phase I by 2015
- TMU at other ACC and APP by 2016
Airspace element search tool

Layers

Properties

RPL Database

Route Detail

Aircraft Performance Database

Status Monitor

Weather Information

Regulated Elements Database
IMPLEMENTATION CHALLENGES

- CHANGE MANAGEMENT
- TECHNOLOGY ABSORPTION
- MANPOWER
- DEFINING METRICS
- BUY IN FROM STAKEHOLDERS
ROAD AHEAD......

- Develop methodology for determining capacity
- Process of Safety Management throughout
- ATFM Letters of Agreement
- ATFM Personnel and Training
- Develop and Publish ATFM Regulations

10/24/2014
Adopt the best practices from ATFM lessons learned around the world …

Develop and Implement OUR OWN INDIAN NATIONAL ATFM SOLUTION with CDM … and

Simultaneously ensure capability to participate in the regional ATFM efforts for “SEAMLESS ATM”. 