



FIFA World Cup 2022 Air Traffic Flow Management Training

Pre-requisite Training : ATFM Implementation

(Virtual, 23 March 2022)

ICAO MID Office





Air Traffic Management (ATM)

The dynamic, integrated management of air traffic and airspace including ATS, ASM and **ATFM** — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.



Air Traffic Flow Management (ATFM)

A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that **ATC capacity is utilized to the maximum extent possible**, and that the **traffic volume is compatible with the capacities declared by the appropriate ATS authority**.



Capacity Management

The capacity of an ATS system depends on many factors, including the followings:

- ATS route structure,
- Navigation accuracy of the aircraft using the airspace,
- Weather-related factors,
- ATCO workload, and
- Airspace Sectorization



Capacity Management

- Every effort should be made to provide **sufficient capacity** to cater to both normal & peak traffic levels;
- Number of aircraft provided with an ATC service **shall not exceed** that which can be **safely handled**.
- ATC capacity should be expressed as the **maximum** aircraft which can be accepted over a **given period of time** within airspace/aerodrome.

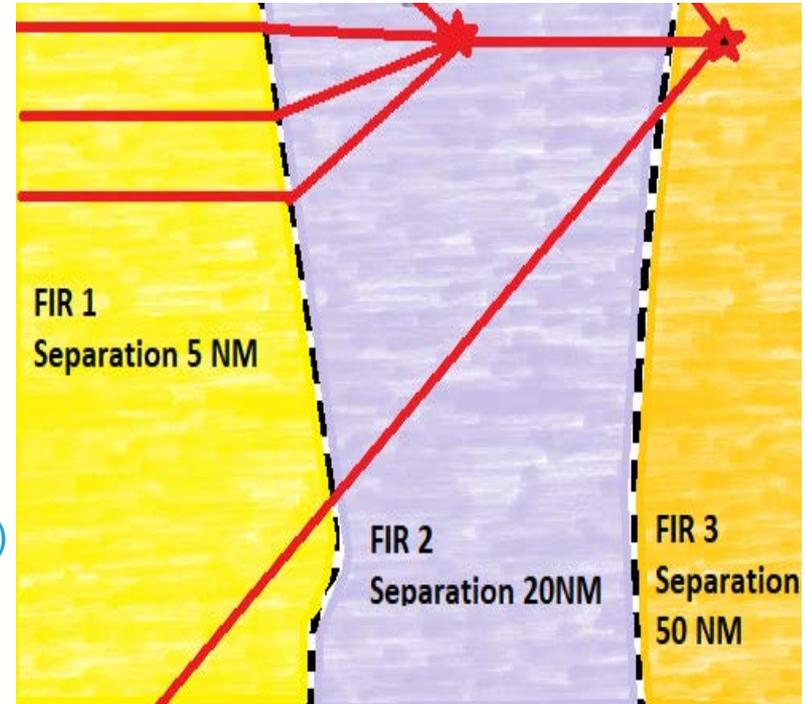


Regulation of ATC capacity & traffic volumes

- Where traffic **demand varies** significantly, facilities & procedures should be implemented to vary the **number of operational sectors or working positions**.
- In case of **particular events** have a **negative** impact on the declared **capacity** of an airspace/aerodrome, the capacity of the airspace/aerodrome shall be **reduced**.
- Whenever possible, the capacity related to such **events** should be **predetermined**.
- Whenever **demand** in an airspace/aerodrome is forecast to **exceed capacity**, **measures** shall be implemented to **regulate** traffic volumes

Capacity building

- Flexible use of airspace
 - ASM
 - CMC
- Reduction of separation
 - Infrastructure (CNS)
 - Competency and Techniques (ATCO)
 - LOA (Procedure/Agreement)
- PBN implementation
 - Infrastructure (Ground, Onboard and Satellite)
 - Airspace design (En-route & Approach)
 - Parallel, Unidirectional and Direct Airways
 - Splitting entry & exit points
 - CCO & CDO





Air Traffic Flow Management

- ATFM should be implemented on the basis of a **regional air navigation** or multilateral agreement.
- ATFM should be carried out in:
 - **Strategic** planning
 - **Pre-tactical** planning
 - **Tactical** operations



Establishment of ATFM TF

- ICAO MID **ATFM Seminar** recommendation
- MIDANPIRG agreed decision 16/16, to **establish ATFM TF.**
- ICAO MID ATFM TF/1 **established the ATFM Core Team** to follow-up on the agreed actions by the ATFM TF



Development of MID Region ATFM Plan (MID DOC 014)

References:

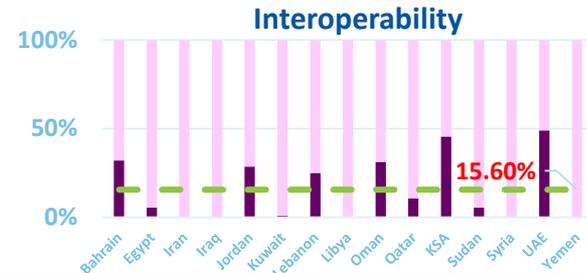
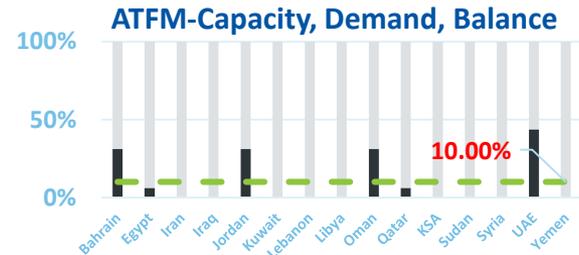
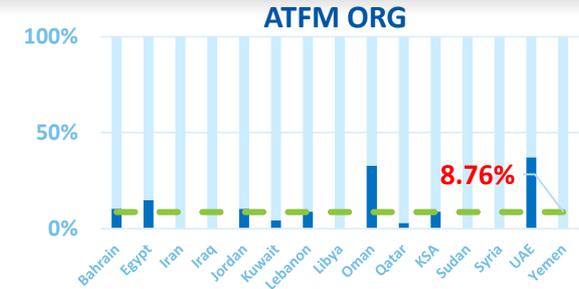
- ICAO Manual on Collaborative Air Traffic Flow Management Doc 9971;
- APAC ATFM Plan; and
- MID Air Navigation Strategy.



Development of MID DOC 014-V.1

Based on the followings activities and among the centralized and Multi-Nodal options, the ATFM proposed & MIDANPIRG endorsed **Multi-Nodal** solution.

- ICAO MID Questionnaire.
- ATFM Core Team activities
- Joint ACAO/ICAO ATFM Workshop





Development of MID DOC 014-V.1

- ATFM TF/4 proposed & MIDANPIRG18 endorsed MID ATFM CONOPS V1.0
- For better coordination between ANSPs and improve ATS planning, MIDANPIRG18 endorsed the ATM Operational Data Exchange process



Development of MID DOC 014-V.2

- ATFM TF/5 meeting agreed to develop MID ATFM **Framework**, and conducted virtual breakout meeting to brief States FPs regarding ICAO MID **Data Exchange process**.
- Based on the ATM SG/7 meeting outcomes, and MIDANPIRG19, MID ATFM Plan **V2.0 was endorsed**.



MID Region ATFM Plan V.2 content

- **PART I – MID ATFM Framework**
- **PART II – MID ATFM Concept of Operation (CONOPS)**
- **PART III – MID ATFM Common Operating Procedure & Implementation Guidance**



MID ATFM Framework-Current situation

- ANSPs have **limited ATFM procedures in place** to manage the traffic flows.
- **Lack of regional agreement** to manage traffic flows.
- **Prediction of traffic are not always accurate, automated, or cross-border shared.**
- Strategic balancing at airports is undertaken through **slot allocation process or MDIs.**
- Balancing of **arrival demand** at airports is **mostly reactive at tactical phase.** As a result, use of inefficient means of balancing flows, such as airborne **holding** and excessive **vectoring are very common.**



MID ATFM Framework-Performance Improvement Plan

Phase IA (1 year)

- ATFM Regulations
- Strategic Capacity-Demand Monitoring & Analysis
- Pre-Tactical Capacity-Demand Monitoring & Analysis
- Pre-Tactical ATFM Execution
- Post-Operations Analysis

Phase IB (1 year)

- ATFM Systems
- Capacity Improvement
- Strategic ATFM Execution
- Pre-Tactical Capacity-Demand Monitoring & Analysis
- Pre-Tactical ATFM Execution

- Tactical Capacity-Demand Monitoring & Analysis
- Tactical ATFM Execution
- Post-Operations Analysis

Phase II (3 years)

- ATFM Systems
- Pre-Tactical Capacity-Demand Monitoring & Analysis
- Tactical Capacity-Demand Monitoring & Analysis
- Tactical ATFM Measures



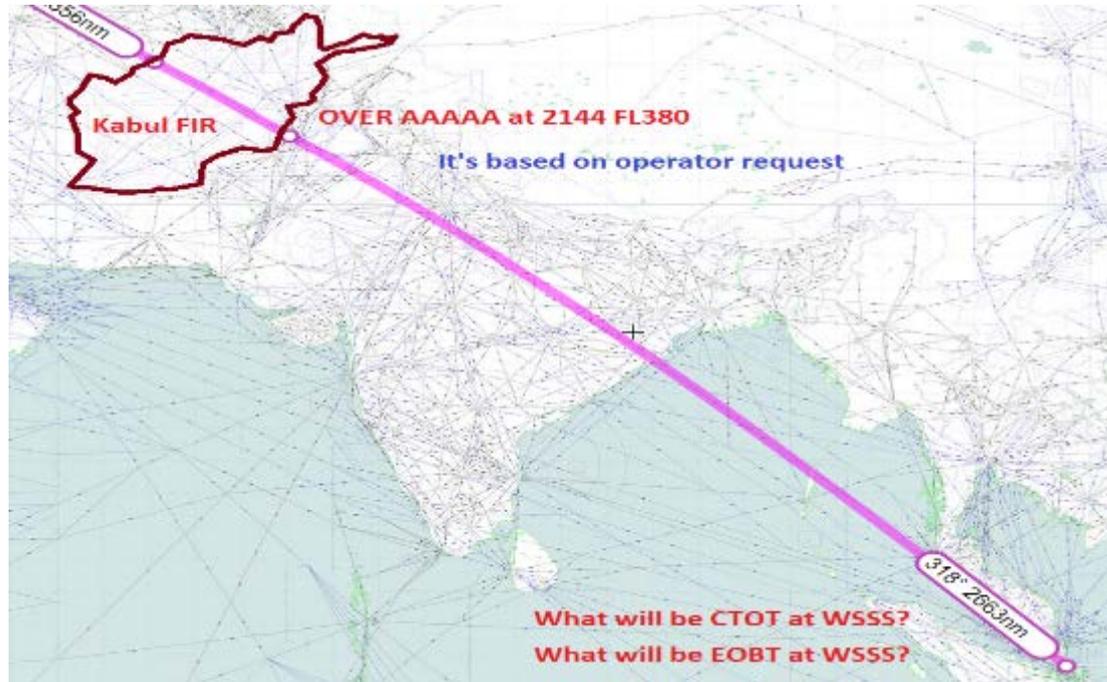
CONOPS-ATFM Measure

ATFM Measure will balance demand vs capacity or assist safe expeditious flow of traffic.

- Tactical ATFM measures are taken on the day of operation
 - Ground Stop (GS)
 - Miles in Trail (MIT)
 - Minutes in Trail (MINIT)
 - calculated time over an arrival fix (AFIX)
 - calculated time over an en-route fix (RFIX)
- Pre-tactical ATFM measures one day before day of operation
 - Ground Delay Program (GDP) using CTOT
- Strategic ATFM measures more than one day before day of operation
 - Airport slot allocation process
 - Minimum Departure Intervals (MDIs)



Successful Implementation-BOBCAT





Successful Implementation-Australia





CONOPS-Delay Absorption Intent

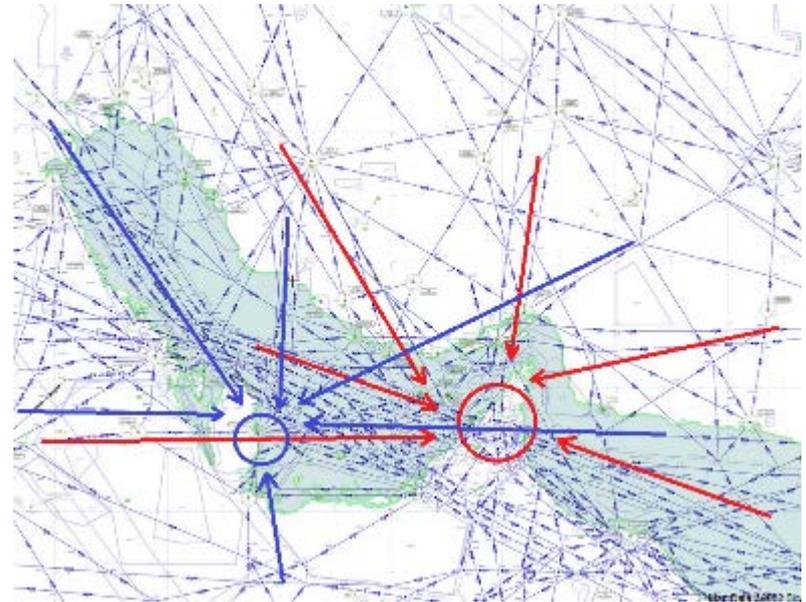
Aircraft Operators can choose how to distribute the ATFM measure delay throughout various phases of flight as follows:

- Gate Delay Intent
- Airport Surface Delay Intent
- Airborne Delay Intent



CONOPS- Airborne Delay Intent-XMAN

The Cross Border Arrival Management (XMAN) is a operational procedure utilized by ATSUs of multiple States that aims to improve and optimize arrival management operations for major airports. With XMAN procedure the **holding time** of an aircraft is **cut** by **reducing** their **cruising speed** during the final en-route phase of flight.





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THANK YOU