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ATFM Policy Review

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SUMMARY

This paper reviews IFATCA Air Traffic Flow Management (ATFM) Policies and recommends changes to ensure the policies will be compatible with future ATFM concept of operations.

1. INTRODUCTION

1.1. ICAO's Global Air Navigation Plan 2016-2030 focuses on the development and implementation of Performance Based Navigation (PBN), Continuous Descent Operations (CDO), Continuous Climb Operations (CCO) and Air Traffic Flow Management (ATFM). All of these elements are necessary steps towards global interoperability and global air traffic system efficiency.

1.2. ATFM is an essential component in Air Traffic Management efficiency and effectiveness. It aims to enhance safety by ensuring a balance between traffic demand and capacity. The number of States that manage traffic flows and implement ATFM services is increasingly mandated. Therefore, it is important to review our policies for consistency and effectiveness allowing for future concepts and across border implementation.

1.3. To ensure that the IFATCA ATFM policy will support the effective implementation of the proposed changes to ICAO Standard and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS), it was suggested that IFATCA ATFM policy be reviewed with reference to the appropriate characteristics of future ATFM services. (SL-2025_85)

1.4. For the purposes of this paper and its proposed policy amendments, it may be necessary to consider that the Flow Management Position coordinates between ATC and the ATFM Unit. In this paper, we will focus on the relationship between ATC and the ATFM unit. The managers (Flow manager, ATC Manager, and ATFM Manager) are all part of the collaborative decision-making process but the ATCO (whether a flow controller or not) is responsible for implementing the ATFM Measures which originate in the ATFM Unit.

1.5. Understanding the concept of operations and process in ATFM will be essential to identify policies that are necessary to support future ATFM services.

2. DISCUSSION

2.1. For ATFM service to be effective, units must engage in collaborative decision making by coordinating with and considering the interests of all phases of ATFM. All units must be in coordination with ATC units, meteorological units, military units and airspace users and other relevant stakeholders to consider the various constraints, system limitations, unexpected weather conditions, and user requirements to develop the most efficient plan.

2.1.1. ATFM is the service which ensures the safe and efficient flow of air traffic by balancing capacity with traffic demand.

2.1.2. ATFM consists of measures used to manage air traffic demand for a given airspace, along a given route, or at an aerodrome, so as to ensure the most effective utilisation of the available airspace or aerodrome capacity.

2.1.3. In SL 2025_85, a new definition for strategic capacity is proposed, in which it refers to the maximum number of aircraft to which an ATC unit can provide services under normal operating conditions in a given period of time. Very similar wording is used in the IFATCA TPM in the Definitions section.

2.1.4. Operational capacity refers to the available capacity of an ATC unit at a specific time. Factors affecting operational capacity include weather, special activities, controllers' workload and staffing, etc. Operational capacity is determined by the ATC unit.

2.2. ATFM Concept of Operations

2.2.1. Due to the regulatory framework, organisational structure, and operational environments, ATFM service is handled differently across regions.

2.2.2. In a Centralised ATFM Concept, one unit provides services across a wide region. An example of this is EUROCONTROL's Network Manager Operations Centre (NMOC).

2.2.3. In a Distributed ATFM Network, several ATFM units or nodes are independently responsible for services within their domain. An example is the ATFM framework in the Asia/Pacific region, where interconnected units manage traffic without a central facility. (Asia Pacific Regional Framework, ICAO, 2022)

2.2.4. One key to the successful implementation of an effective ATFM service is achieving robust coordination among all aviation stakeholders. ATFM must be performed as a collaborative decision-making process where ATFM units, ATC units, airport operators, aircraft operators and other stakeholders work together to improve compliance and the overall performance of the ATM system. (CANSO, October 2020)

2.2.5. Whether the State or region is configured in a Centralised ATFM Concept or a Distributed ATFM Multi-Nodal Network, close coordination between ATFM unit and ATC unit is essential for implementation of effective ATFM service.

2.3. Phases of ATFM

2.3.1. ATM Planning is an important step in the implementation of ATFM services in order to establish an accurate picture of the expected traffic demand through the collection, collation and analysis of air traffic data. (ICAO Doc 9971)

2.3.2. ATFM is a continuous process that houses three operational phases with reference to the time frame prior to the operation, and it could start as early as months before the day of operations. After the event, a final phase called Post Operations Analysis is conducted. This is an important phase to review the effectiveness of measures implemented. Once the ATFM process is reviewed, the suggestions and comments obtained will be considered to improve future ATFM operations.

2.3.3. IFATCA policy must support all phases of ATFM recognising that airspace systems are dynamic. While advance planning is valuable, changing conditions require a comprehensive policy that enables timely operational adjustments.

2.3.4. **Strategic:** This phase involves continuous traffic data collection and regular review of constraints vs. capacity available. This phase usually results in the creation of a plan of ATFM measures to be implemented on the day of operations.

2.3.5. **Pre-Tactical:** This phase normally starts from one day up to one week prior to operations. The main objective of the pre-tactical phase is to optimise capacity through an effective organisation of resources (e.g., sector configuration management, use of alternate flight procedures).

2.3.6. **Tactical:** Solutions and measures are adopted on the day of the operation. Traffic flows and capacities are managed in real time. The daily plan is amended taking into account any event likely to affect it. This is when the Flow Management Position (FMP) is required to be deeply involved in proactive traffic monitoring, coordinating with air traffic control managers, and adjusting ATFM measures as necessary to ensure the measures actually address the demand/capacity imbalances.

2.3.7. **Post Operations Analysis:** This is the final phase of the ATFM planning and management process. During this phase, an analytical process is carried out to measure, investigate, and report on operational processes and activities. This analysis is the cornerstone in developing best practices and/or lessons learned that will further improve the operational processes. It should cover all ATFM domains and all external units relevant to an ATFM service. (CANSO, 2019).

2.3.8. FMP is not only required to be familiar with elements involved in different phases of the ATFM process, but also required to continuously coordinate with ATC Managers during different phases of the process to ensure solutions/measures are implemented successfully.

2.4. Flow Control vs Flow Management

2.4.1. Flow Control refers to the duties within the ATC units for adjusting the flow of traffic. A good example is the use of Arrival Manager (AMAN) to adjust the speed and time for aircraft entering approach control airspace or Terminal Maneuvering Area (TMA). Tactical measures like speed control, holding, vectoring etc. will be used to achieve the Arrival Manager (AMAN) advisory time. Flow control measures are implemented within the ATC unit and usually coordinated among the flow controllers themselves. Flow control may be used where there are no ATFM measures, or where ATFM measures alone have not established a satisfactory flow of traffic.

2.4.2. Air Traffic Flow Management Service (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 utilised to the maximum extent possible, and aligned with the traffic demand. Once the event is over, post operational analysis will be carried out to evaluate the effectiveness of ATFM measures for future improvement.

2.4.3. Understanding the needs of the ATC unit will help the ATFM unit to formulate the most suitable plan to manage overall traffic flow. ATC units should also maintain close

coordination with ATFM units to feedback effectiveness of ATFM measures so they can adjust and plan accordingly. Close collaboration between all stakeholders would ensure the successful implementation of ATFM measures.

2.4.4. Therefore, a dedicated position should be established as a bridge between ATFM unit and ATC unit. The position could be referred to as the Flow Management Position. Flow Management Position refers to a position within an ATC unit responsible for coordination with the ATFM unit concerned.

2.5. ATFM Measures There are various ATFM measures which are the means used to manage air traffic demand for an airspace, along a given route, or at an aerodrome so as to ensure the most effective utilisation of the available airspace or aerodrome capacity.

2.5.1. **Minutes-in-trail** (MINIT)/ Miles-in-trail (MIT). This is expressed as the number of minutes or miles between each successive aircraft at an airspace boundary. The workload associated with its compliance falls on the air traffic controller because of potential upstream network effects. This measure is often used enroute when controlling flow to and from a particular airport where a high traffic flow is anticipated.

2.5.2. **Minimum Departure Intervals** (MDIs). Like Miles in Trail, MDIs are assigned departure times or distance intervals which are applied to successive departures from a single aerodrome typically for short periods when a departure sector becomes excessively busy. MDI, together with MINIT/ MIT could be originated by ATFM or ATC units and implemented by ATCOs to regulate traffic flow into a particular sector for a short period of time.

2.5.3. **Fix Balancing.** Often used in concert with MIT, Fix balancing is applied during flight to avoid delays. The aircraft is assigned a different arrival or departure fix than the one indicated in the flight plan to assist with balancing demand or to mitigate periods of meteorological constraints. At the operational level, ad-hoc fix balancing could be coordinated by flow control measures to tactically re-route traffic so as to balance sector workload.

2.5.4. **Ground Delay Program (GDP).** This is a tool used to manage air traffic when demand exceeds airport capacity. Instead of airborne holding, a GDP delays flights on the ground at their departure point. During a GDP, Calculated Take-Off Time (CTOT) or Expected Departure Clearance Time (EDCT) is passed to affected flights through relevant ATFM units. The ATCO(s) at the departure aerodrome should ensure the flight will depart at the agreed window with reference to the assigned time.

2.5.5. **Airspace Flow Program.** A measure used to manage congestion in specific constrained areas of airspace identified as Flow Constrained Areas (FCA). AFPs are effective during severe weather events, high anticipated flight volumes, or low staffed areas. Flights which will traverse the affected airspace are assigned specific departure times to mitigate the flow until the constraint is no longer a concern.

2.5.6. **Ground Stop.** A Ground Stop requires certain aircraft to remain on the ground at the departure airport during an unpredicted adverse situation. Due to its great impact on ATC, aerodrome operators and airspace users, such “zero-rate ATFM measure” should only be implemented when other ATFM measures have been ineffective.

2.6. The importance of ATFM and its role in the future of Trajectory Based Operations (TBO)

2.6.1. ATFM has become an integral element of ATM and it is of paramount importance to ensure ATC capacity is being utilised to the maximum extent possible while protecting

ATCOs from being overloaded (IFATCA 2025, ATFM Licensing Study). In order to realise the maximum benefits of ATFM, it is necessary to know both the strategic capacity and the operational capacity of an ATC unit.

- ATC Capacity is a generic term meaning variously, strategic capacity and/or operational capacity.
- Strategic capacity is the maximum number of aircraft to which an ATC unit can provide services in a given period of time, under the anticipated normal operating conditions.
- Operational capacity is a dynamic, time-specific capacity value derived from the strategic capacity of an ATC unit.

2.6.2. This allows ATC units and ATFM units to assess where and when demand is likely to exceed the available ATC capacity, and to implement measures to provide a reduced and even flow of traffic where demand would otherwise have exceeded capacity, in a dynamic environment. (ICAO- Air Navigation Commission- Air Traffic Management Operations Panel- Proposed Amendments to Annex 11 and PANS-ATM [Doc 4444 Concerning ATFM])

2.6.3. With the implementation of FF-ICE and provisions of SWIM in the future, it is expected that the flight predictability will be higher, bringing benefits like improving the reliability of CTA time in AMAN. FF-ICE provides flight trajectory negotiation during pre-departure (FF-ICE Release 1 [R1]) and post-departure (FF-ICE Release 2 [R2]) phases. Negotiation between airspace users and ANSPs on flight trajectory will be based on various operational factors, including but not limited to weather conditions, activation of special activities area, and most importantly, the capacity of an ATC unit. Thus, regulating the flow of traffic in order to balance traffic demand and ATC unit capacity forms the basis of FF-ICE trajectory negotiation. This is why ATFM is an essential part in FF-ICE implementation, and it is needed to be “always-on” in future FF-ICE environments.

2.6.4. FF-ICE allows airspace users to operate flights according to an agreed trajectory with ANSPs and enable TBO. Details of FF-ICE R2 will be available in the near future, although there is no proposed update for this policy at this moment.

CURRENT IFATCA POLICIES RELATED TO ATFM

2.7. IFATCA Policy ATS 3.1 REPLACEMENT FLIGHT PLANS

> ICAO should review, as soon as possible, world-wide procedures and systems for amending or replacing flight plans or flight plan information, to ensure that such system and procedures exist, and that amended or replacement flight plans, or portions thereof, are easily identifiable to ATCOs.

2.7.1. Where an initial flight plan route due to ATFM restrictions is cancelled and a new plan filed, there is a need to ensure that the replacement flight plan can be identified as such. Procedures to achieve this have been in use in the European Region for several years but have caused difficulties to States in other regions.

2.7.2. In FPL2012 format, Flight Plan (FPL) is submitted, amended, and replaced through AFTN and various flight plan processing systems. Due to system limitations, different stakeholders might not possess the same/ latest version of FPL. With the implementation of FF-ICE, the flight information is available on a shared SWIM

platform, ensuring all stakeholders can access the same set of the latest flight plan data.

2.7.3. These developments are successful mitigations to ensure that ATCOs will be able to easily access amended flight plan data.

2.7.4. FF-ICE will be implemented in the coming years and has a sunset date of 2034 in the 14th ICAO Air Navigation Conference. Before the global implementation of FF-ICE, this policy will remain valid with minor amendments with reference to the latest technology development. This will be covered by another working paper "Technical and Professional Manual (TPM) ATC Policy Reviews" by TOC this year.

2.8. IFATCA Policy ATS 3.6 AIR TRAFFIC FLOW MANAGEMENT – ADHERENCE

> IFATCA recognises the potentially dangerous situations that can arise when slot times are not adhered to.
>
> When a departure slot time is used, the time should be passed to the ATC unit at the departure airfield.
>
> The aircraft operator should be ready for departure to meet the assigned ATFM departure slot.
>
> Civil Aviation Administrations should pursue with the utmost vigour those operators who consistently fail to comply with ATFM measures.

2.8.1. The process of ATFM involves continual monitoring and regulation of the flow of air traffic. The timely implementation of ATFM measures and the communication of restrictions to the appropriate controllers are of prime importance, as is the adherence to restrictions by aircraft operators.

2.8.2. Since ATFM is essential for FF-ICE implementation which enables TBO, compliance of ATFM measures will be core to future Air Traffic Service. The ATFM measures do not only include departure slot time, e.g. Calculated Take-off Time (CTOT), but also includes all the ATFM measures as discussed in previous sections, so as to ensure ATCOs workload is managed while ATC capacity is balanced to cope with traffic demand.

2.8.3. Since compliance of ATFM measures is often achieved by ATCOs through ATC clearance, ATCOs shall be provided with sufficient information regarding ATFM measures implemented with support of the appropriate system and procedures to ensure compliance with necessary measures. This policy should be amended to assist ATCOs in achieving compliance of ATFM measures.

2.9. IFATCA Policy ATS 3.26 AIR TRAFFIC FLOW MANAGEMENT – IMPLEMENTATION

> IFATCA encourages the implementation of ATFM processes provided that:
>
> - The process achieves an optimum overall performance.
> - Air Traffic Controllers and Flow Management Controllers are involved in the design of their local procedures and the determination of capacity values and / or occupancy values.
> - The communication between and the compatibility of regional systems is established.

- The tactical capacity is managed on an operational level.
- The measures, including restrictions, are transparent to all users.
- Procedures are in place to allow controllers to report occasions where they felt overloaded or sector capacity values were exceeded. Feedback should be given to the reporting controller.

2.9.1. IFATCA identified the need for a policy by addressing the requirements of an ATFM system, present and future.

2.9.2. ATFM has become a necessary concept to a core safety and capacity function around the world. For this reason, it is no longer an optional nicety but rather a necessary service. IFATCA needs to support its implementation and align its policies with ICAO terminology.

2.9.3. The first bullet point in this policy adds no real safeguard and actually weakens the policy statement. Optimum overall performance is already the point of the process. It is redundant and unnecessary. Therefore, it should be removed.

2.9.4. In the discussion above, we have differentiated between the roles of ATCOs, Flow Management Position, and ATFM Personnel in regard to ATFM service. The term Flow Management Controllers was not found to be consistent with any ICAO or IFATCA terminology. In determining capacity values, it is in the interest of the ATCOs to be involved in the process. Therefore, it is recommended to strike Flow Management Controllers from this statement.

2.9.5. Since ATFM is an integral part of ATM, especially in global implementation of FF-ICE and the future of TBO, implementation of ATFM should be mandatory.

2.9.6. ATC Capacity is the value of an ATC unit that should be determined in order to implement appropriate ATFM measures. There are two types of capacity values, including strategic capacity which is determined by the appropriate authority; and operational capacity which is determined by ATC unit. The term tactical capacity is therefore irrelevant and should be removed from this policy.

2.9.7. ATFM Service includes all measures and restrictions implemented to balance capacity with demand. Therefore, to include restrictions is redundant and should be replaced by ATFM Service. Additionally, measures implemented by ATFM Service should be communicated to all stakeholders, not only the airspace and aerodrome users.

2.9.8. It is important that ATCOs be involved in determining the capacity values to ensure that they are not overloaded while the capacity of the respective ATC unit is maximised. Feedback mechanisms shall always be provided to ATCOs.

2.9.9. In the concept of ATFM operations, capacity would not be managed but instead would be determined and reviewed regularly. When there is an imbalance between the traffic demand and declared capacity, ATFM measures will be implemented with such information being disseminated to all relevant stakeholders so as to achieve a high compliance rate.

2.9.10. As proposed in the State Letter (SL-2025_85), an ATFM unit shall be supported by a flow management position designated for each applicable ATC unit. Additionally, a flow management position may be established as a standalone position or combined with an existing position.

2.9.11. ATFM is a collaboration between ATC and ATFM units, among different ANSPs and across various airspace structures. Maximum benefit from the ATFM services can only be realised if this requirement is implemented globally. ATFM services should be implemented as a mandatory complementary service to ATS on the basis of

regional air navigation agreements. Communications between various ATC and ATFM units should not be limited to the regional level but to be “cross-border, intra-regional, regional, and inter-regional” as per ICAO long-term provisions of ATFM operations.

2.10. IFATCA Policy TRNG 9.4.3 AIR TRAFFIC FLOW MANAGEMENT (ATFM) (Updated as per WP/153 in 64th IFATCA Annual Conference)

This policy was reviewed and it was found that there is no current need for a change.

> ATFM personnel shall be subject to a competency based training and assessment framework, which amongst others will require the ATFM personnel to demonstrate a comprehensive knowledge, skill and experience of all relevant ATC procedures and ATFM duties.
>
> The responsibility for spacing and separation remains solely with ATC.
>
> ATFM personnel shall be required to familiarise themselves with major changes in ATC procedures and maintain their acquaintance with problem areas in relation to ATFM within their region.

3. CONCLUSION

3.1. The evolution of Air Traffic Flow Management into a globally interoperable, collaborative, and continuously active service requires IFATCA policies to remain aligned with emerging ICAO concepts, including FF-ICE and Trajectory Based Operations. ATFM is no longer a contingency mechanism but a foundational element of modern Air Traffic Management, essential to balancing demand and capacity while protecting air traffic controllers from excessive workload.

3.2. This review confirms the need to update IFATCA ATFM policies to ensure consistency and to clearly distinguish between the roles of ATFM personnel, Flow Controllers, and the Flow Management Position. Close coordination between ATFM units and ATC units is essential for the implementation of an effective ATFM Service.

3.3. ATFM measures applied at the tactical and operational level are frequently executed through the provision of Air Traffic Control Services. By strengthening policy in these areas, IFATCA ensures that ATFM services will continue to support safe, efficient, and resilient air traffic operations in an increasingly complex and data-driven ATM environment.

3.4. IFATCA Policies shall be compatible with latest development of ATFM concepts of operations and reflect the need for ATFM services in the future operational environment with FF-ICE and TBO. These include the involvement of ATCOs in strategic and operational capacity determination, provision of sufficient ATFM information to ATCOs, and communication between stakeholders on ATFM implementation.

3.5. A dedicated position shall be established as a bridge between the ATFM units and the ATC units. FMP is required to be deeply involved in proactive traffic monitoring, coordinating with air traffic control managers, and adjusting ATFM measures as necessary to ensure the measures actually address the demand and capacity imbalances.

4. DRAFT RECOMMENDATIONS

4.1. It is proposed to amend the IFATCA Policy ATS 3.6 as follows:

ATS 3.6 AIR TRAFFIC FLOW MANAGEMENT - ADHERENCE
IFATCA policy is: IFATCA recognises the potentially dangerous situations that can arise when ATFM measures ~~slot times~~ are not adhered to. When ATFM measures are implemented, sufficient information ~~a departure slot time is used, the time should/~~ shall be passed to relevant stakeholders including ATC units and aircraft operators.~~the ATC unit at the departure airfield.~~ ~~The aircraft operator should be ready for departure to meet the assigned ATFM departure slot.~~ ~~Civil Aviation Administrations should pursue with the utmost vigor those operators who consistently fail to comply with ATFM measures.~~ Appropriate systems and procedures shall be provided to ATCOs to ensure compliance with ATFM measures. The appropriate authorities shall establish a mechanism for addressing repeated non-adherence to ATFM measures.

4.2. It is proposed to amend the IFATCA Policy ATS 3.26 as follows:

ATS 3.26 AIR TRAFFIC FLOW MANAGEMENT - IMPLEMENTATION
IFATCA policy is: IFATCA supports ~~encourages~~ the implementation of an ATFM service provided that: - ~~The process achieves an optimum overall performance.~~ - Air Traffic Controllers ~~and Flow Management Controllers~~ are involved in the design of their local procedures and the determination of strategic and operational capacity ~~values and / or occupancy values.~~ - The communication between and the compatibility of all relevant systems is established. - ~~The tactical capacity is managed on an operational level.~~ - The ATFM service ~~including restrictions~~ is transparent to all stakeholders ~~users~~. - Procedures are in place to allow controllers to report occasions where they felt overloaded or sector capacity values were exceeded. Feedback should be given to the reporting controller. - A Flow Management Position (FMP) is established to ensure appropriate coordination between ATFM units and ATC units.

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