



الهيئة العامة للطيران المدني
CIVIL AVIATION AUTHORITY
قطر QATAR



ICAO

MIDANPIRG/22 & RASG-MID/12

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Air Navigation Global Developments

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Outline

01 AN-Conf/14
Recommendations

03 ATFM

05 GATMOC

02 Contingency framework

04 FF-ICE

06 Action by the meeting



AN-Conf/14

22

Recommendations



Recommendation 1.1/2 – Resilience of the air navigation system

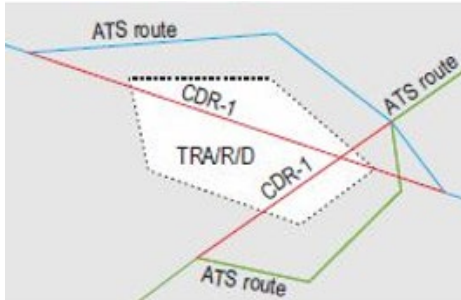
Recommendation 3.1/1 – Project 30/10 - Optimized implementation of longitudinal separation minima

Recommendation 3.1/3 – Enabling successful deployment of trajectory-based operations

Recommendation 3.1/4 – Free route airspace

Recommendation 3.2/2 – Transition to flight and flow – information for a collaborative environment services and cessation of ICAO 2012 flight plan by 2034



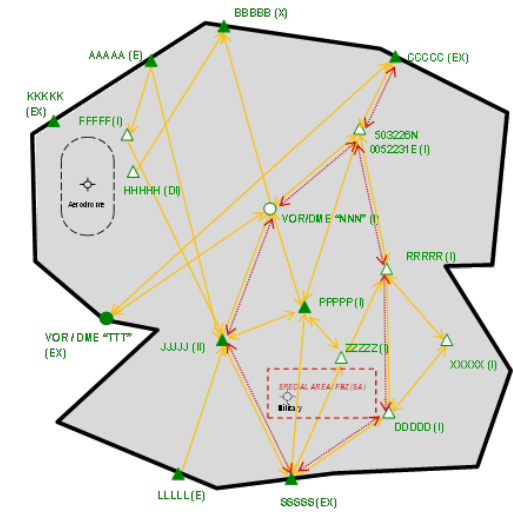
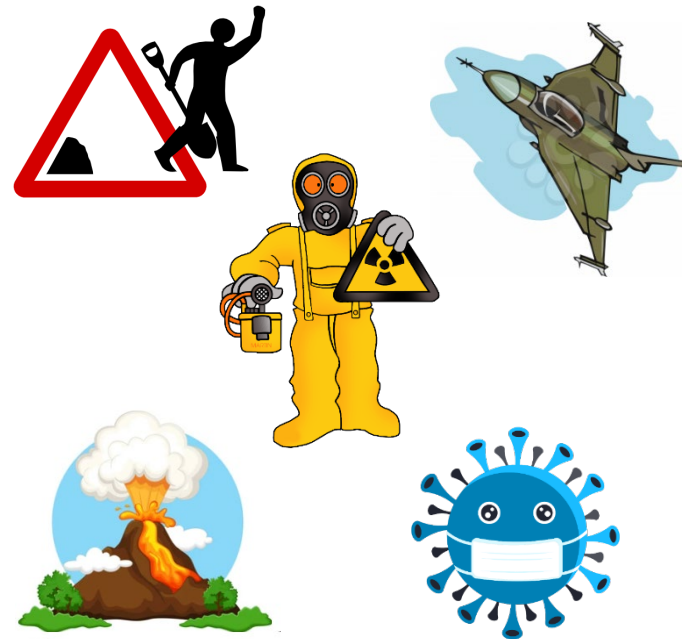


Flexible Use of Airspace

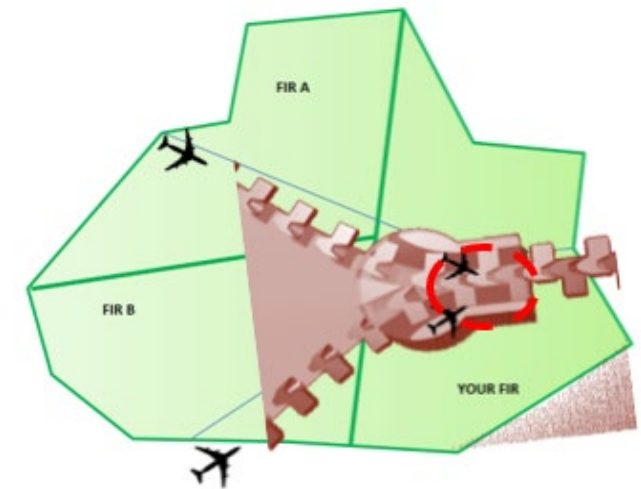
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FF-ICE

Crises and Contingencies



Free route airspace



Global ATFM

04 Contingency Framework



NATURAL DISASTERS



tornado



volcano



earthquake



tsunami



A contingency/crisis can happen anywhere/anytime, impacting flight operations,
so we must be ready to respond

— What is a Contingency response?

A set of both strategic and real-time tactical actions taken to mitigate the impacts that represent a critical threat to the safety, security, and orderly flow of international air traffic.

Planning and preparedness are crucial for contingency response.

Contingency Framework to achieve the above needs to be ***versatile, scalable, effective and responsive.***



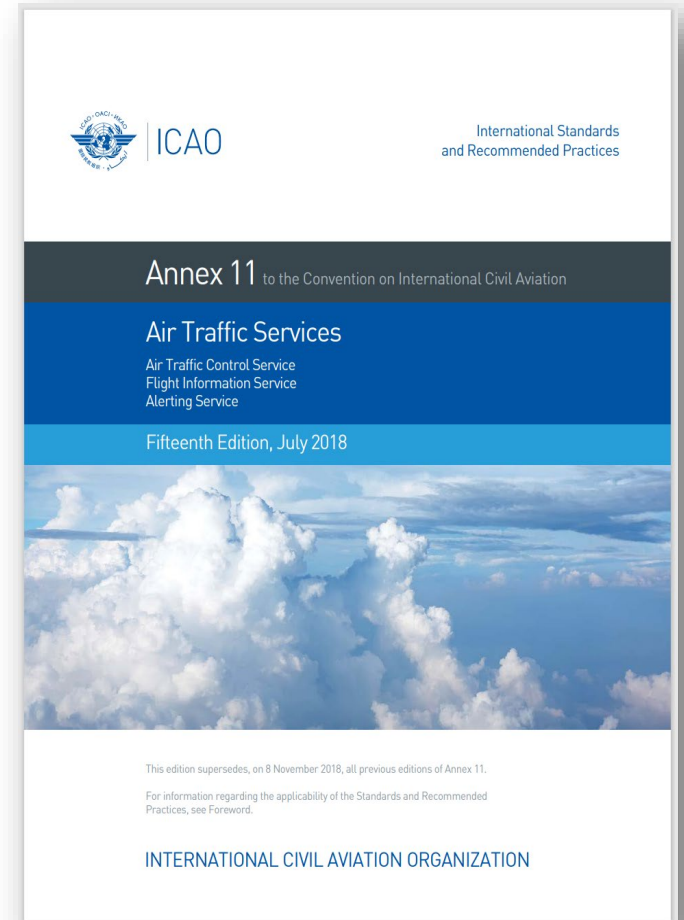
Global mandate

Annex 11 - 2.32 Contingency arrangements

Air traffic services authorities shall **develop and promulgate contingency plans** for implementation in the event of **disruption, or potential disruption**, of air traffic services and related **supporting services** in the airspace for which they are responsible for the provision of such services. Such contingency plans shall be developed **with the assistance of ICAO** as necessary, in **close coordination with** the air traffic services authorities responsible for the provision of services in **adjacent** portions of airspace and with airspace users concerned.

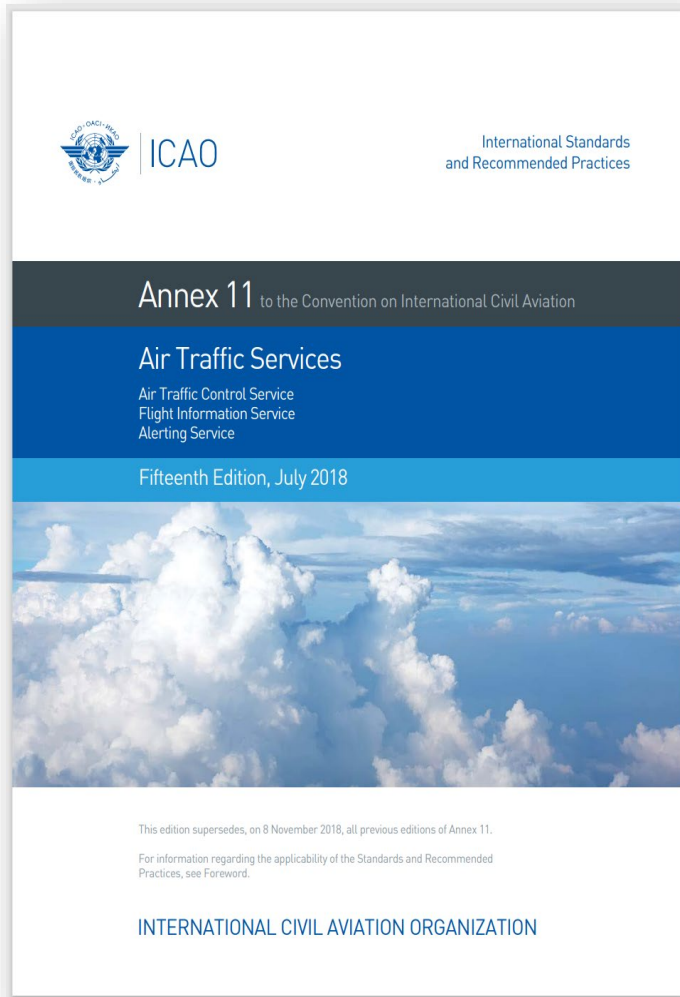
*Note 1.— **Guidance material** relating to the development, promulgation and implementation of contingency plans is contained in **Attachment C**.*

*Note 2.— Contingency plans may constitute a temporary deviation from the approved regional air navigation plans; such **deviations are approved**, as necessary, **by the President of the ICAO Council on behalf of the Council**.*



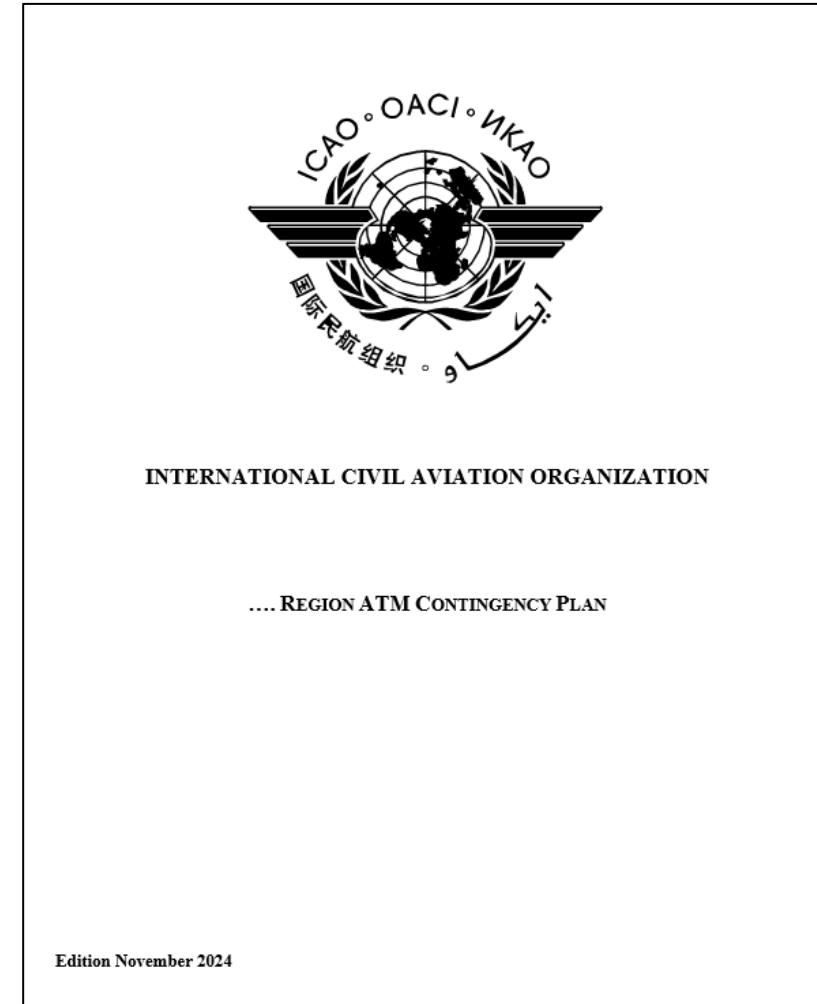
The CCT

Contingency Coordination Team



Described in Annex 11 Attachment C

A **coordinating team** should be designated within, or in association with, a central agency for the purpose of coordinating activities during the disruption.



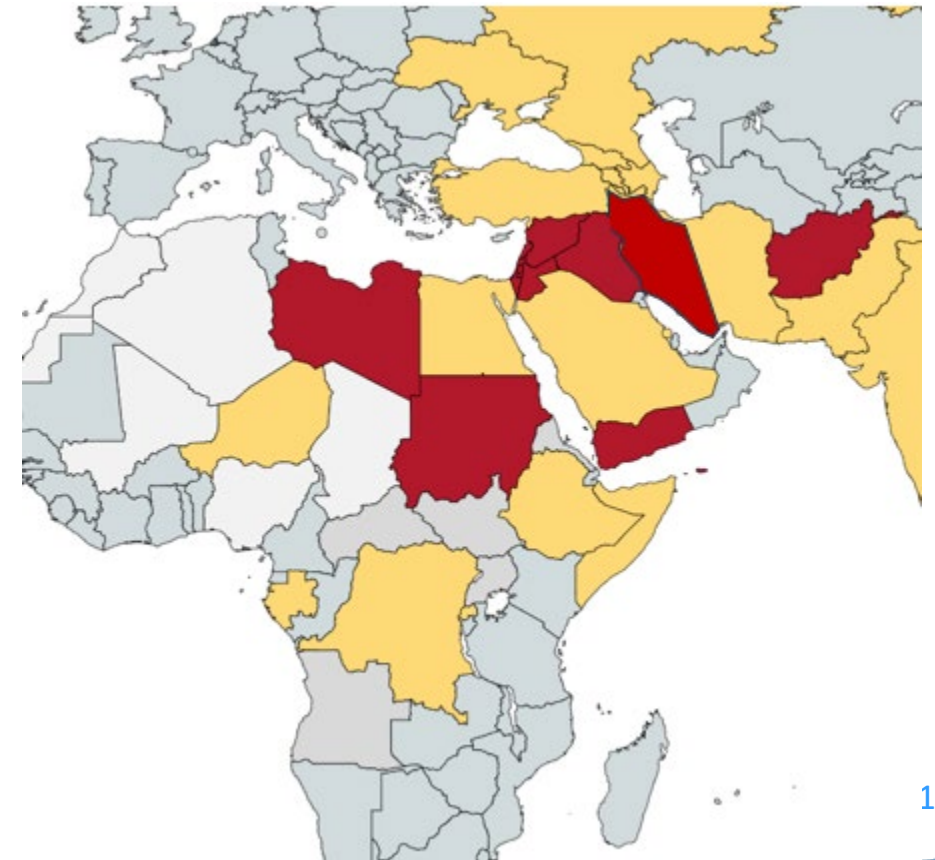
Contingency Coordination Teams (CCTs)

CCTs objectives

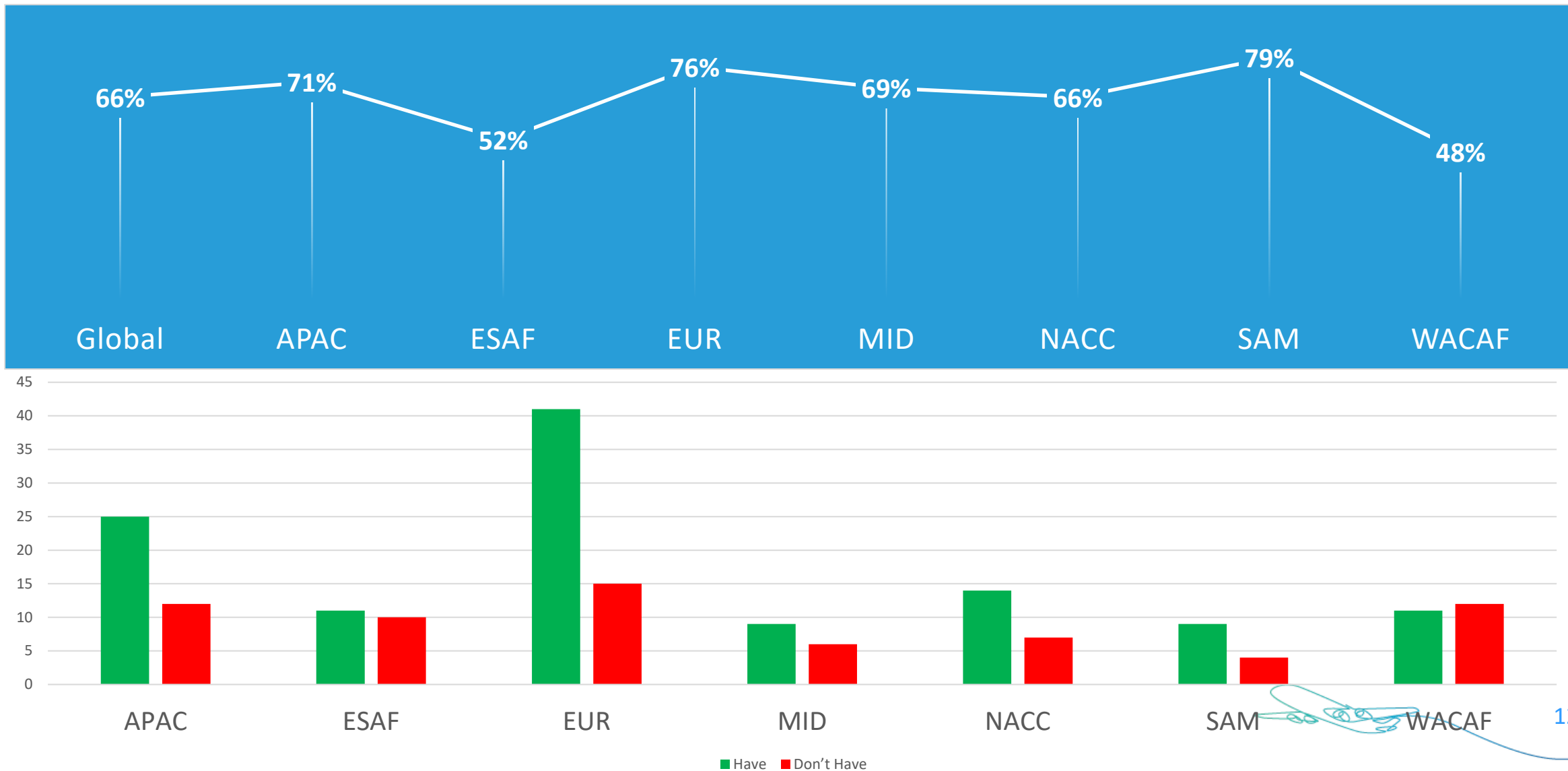
- ✓ Part of the ATM Regional Contingency Plan endorsed by Planning and Implementation Regional Groups (PIRGs)
- ✓ Forum for **coordination** and **sharing** of information between stakeholders;
- ✓ Agree on **contingency arrangements**.
- ✓ Ensure the **safety** and **continuity** of flight operations in the event of **disruption** of ATS.

CCTs are:

- ✓ Established with specific **scope** and **size** depending on contingency event;
- ✓ Also **activated** in cases when **airspace users** decide to **circumnavigate** airspace(s) due to **conflict zones**, **weather**, etc., which might significantly increase the air traffic in other airspace(s).
- ✓ Used for the implementation of **recovery plans** for the **normalization** of flight operations.



ATS Contingency Plans and their Status of



What makes a Contingency Plan useful ?



*Set of agreed **arrangements** to be applied during a contingency situation*

*Set of **procedures** for implementation under specific circumstances*

- *It's a contingency playbook – and it needs to be designed as such.*
- *It is a “procedures” document.*
- *It's a pre-agreed measures*
- *Keep it very, very simple.*

So we should **STOP calling it a plan and..**



Call it

ATM Contingency Arrangements and Procedures

They should be established **collaboratively**
between adjacent ATS Units and airspace users

They should provide for a timely response to a Contingency event



Control is not enough



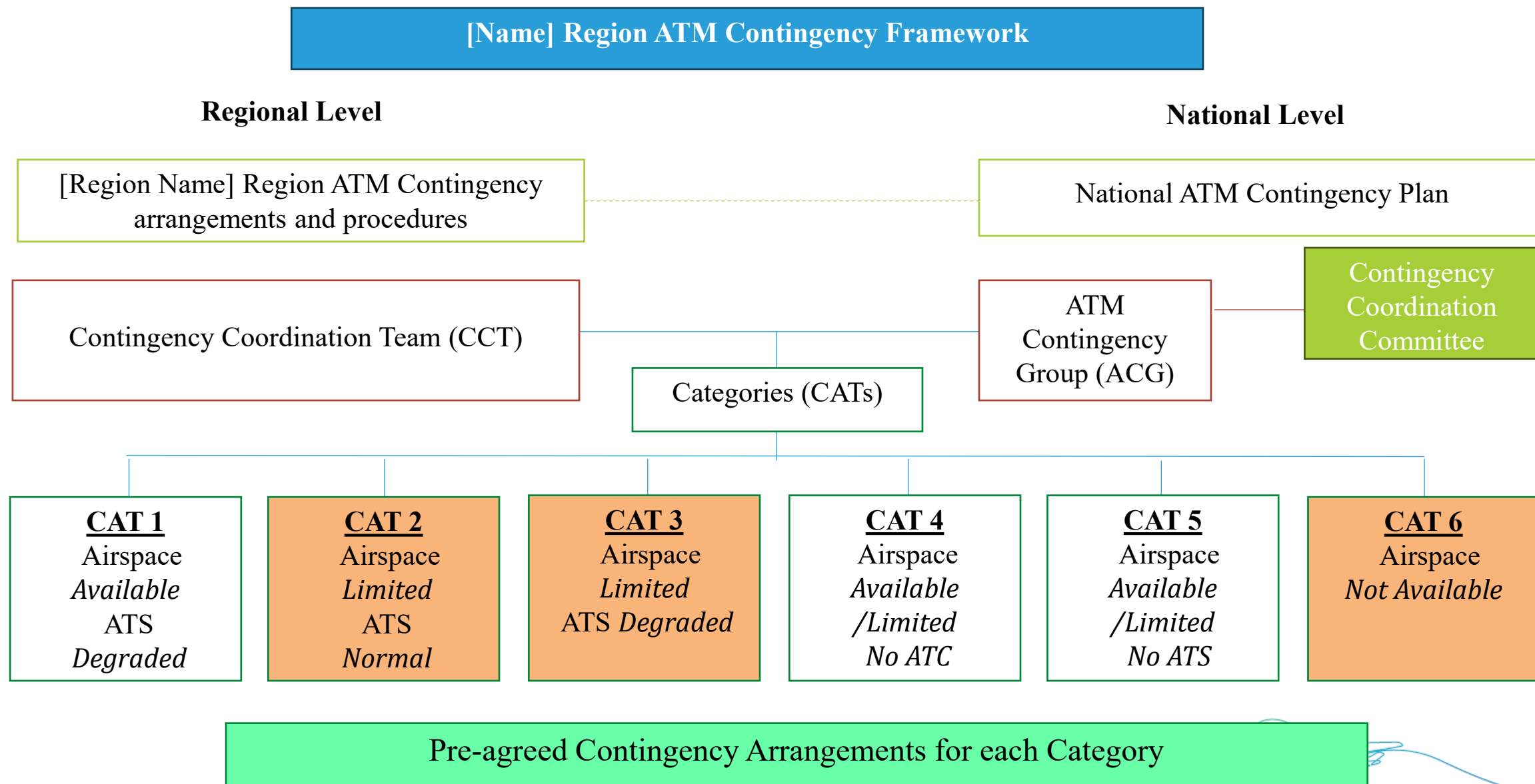
Management is mandatory.



The ATM Contingency Management (CM) Cycle



A Regional ATM Contingency Framework



Fundamentals to be considered for CM

MIDANPIRG/22 & RASG-MID/12

1. Development of the Contingency Plan:

- How the plan is developed, agreed to and authorized
- Is it developed in collaboration with airspace users, military authorities, and adjacent FIRs?

2. Airspace arrangements:

- Utilizing existing ATS routes during disruptions, or contingency routes, FLAS, ATFM measures, etc.?

3. ATS Contingency Procedures:

- Specific procedures for ATS during disruptions (e.g., conflict zone, volcanic ash, severe weather, military activity).

4. Pilots and Operator Procedures:

- Guidance for pilots and operators during contingency situations.

5. Source of information

MET service providers, security, airport operators, airlines, military, media, etc.

6. Cooperation and Communication Procedures:

- How information is exchanged among stakeholders and disseminated to relevant parties.

7. Aeronautical Support Services:

- Supporting services available during contingencies (AIS, CNS, MET, SAR, etc).

8. TRAINING and more TRAINING and EXERCISES



Priority Focus Areas approved by ICAO Council



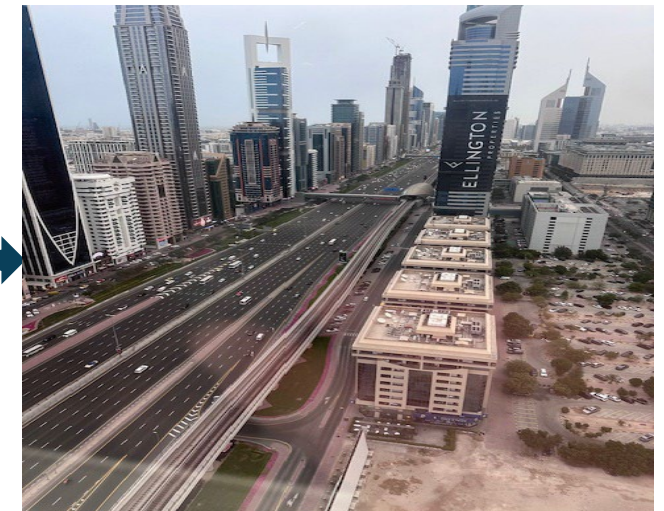
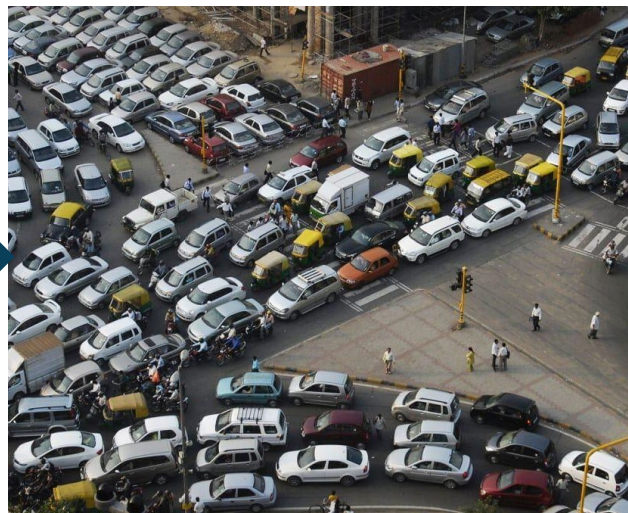
- Preparedness and operational readiness of States
- Preparedness of ICAO through the establishment of an organizational framework to support States
- Response by States in implementing contingency and emergency plans
- Response by ICAO in providing real-time support when a contingency or emergency plan is activated



Amendment of the ICAO Provisions related to ATFM (Annex 11 and PANS-ATM) and the guidance material in Doc 9971



ATFM is demand/capacity balancing and Collaboration



ATFM Provisions - what's new?

New Standards in Annex 11

- States shall, individually or in cooperation with other States, arrange for the establishment and provision of ATFM service for all controlled airspace and designated aerodromes.
- Establishment of ATFM Unit with a defined area of responsibility
- Coordination between ATFM units
- Designation of FMP for each applicable ATC unit
- Determination and declaration of the ATC capacity in the form of **Strategic Capacity** and **Operational Capacity**.
- Coordination and communication **between ATFM units**;
- Exchange of ATFM information.

Currently in PANS-ATM

ATFM service shall be implemented for airspace where traffic demand at times exceeds the defined ATC capacity.

Recommendation in Annex 11

ATFM services should be implemented on the basis of **regional** air navigation agreements or, if appropriate, through **multilateral** agreements and where possible as a **centralized** ATFM organization.

ATFM Provisions - what's new?

PANS-ATM

- ATFM service into **4 phases**:
 - Strategic planning: **7** days or more
 - Pre-tactical: **1 to 6** days
 - Tactical: **on the day**
 - Post operations: after
- Information to be provided to ATFM units
- Exchange of information between ATFM units
- Communication of ATFM units with ATS units, FF-ICE services units, operators, aerodromes, etc.
- FPL and eFPL
- ATC Capacity determination (Strategic and Operational)

Doc 9971: Manual on...

Doc 9971 was published in 2012 (3rd Edition in 2018)

Part 1 – Collaborative Decision Making (CDM)

Part 2 – Air Traffic Flow Management (ATFM)

Part 3 – Airport CDM (A-CDM)

New Part 4: Operational Handbook





ATFM Provisions - what's this require?

An ATFM Implementation Plan (Regional and National) to cover:

- ATFM Civil Aviation Regulations
- ATFM unit with a defined area of responsibility
- Designation of FMPs
- ATFM service Organization structure
- Roles and Functions of ATFM personnel
- System to be used
- Capacity Determination for airspace and designated airports
- ATFM Daily Plan (ADP)
- ATFM Measures to be used
- FF-ICE
- Stakeholders
- Expected timeframe to establish the basic ATFM service
- Training requirements for ATFM personnel, air traffic controllers, and others involved in ATFM
- ATFM CONOPS
- Common operating procedures
- others





Long Term Objective is to achieve the
ATFM NETWORK OF THE NETWORKS
For Global Cooperation

ATFM cross-border
Intra-regional and regional ATFM
Inter-regional ATFM



Stay Tuned for ANW-ATFM 2026

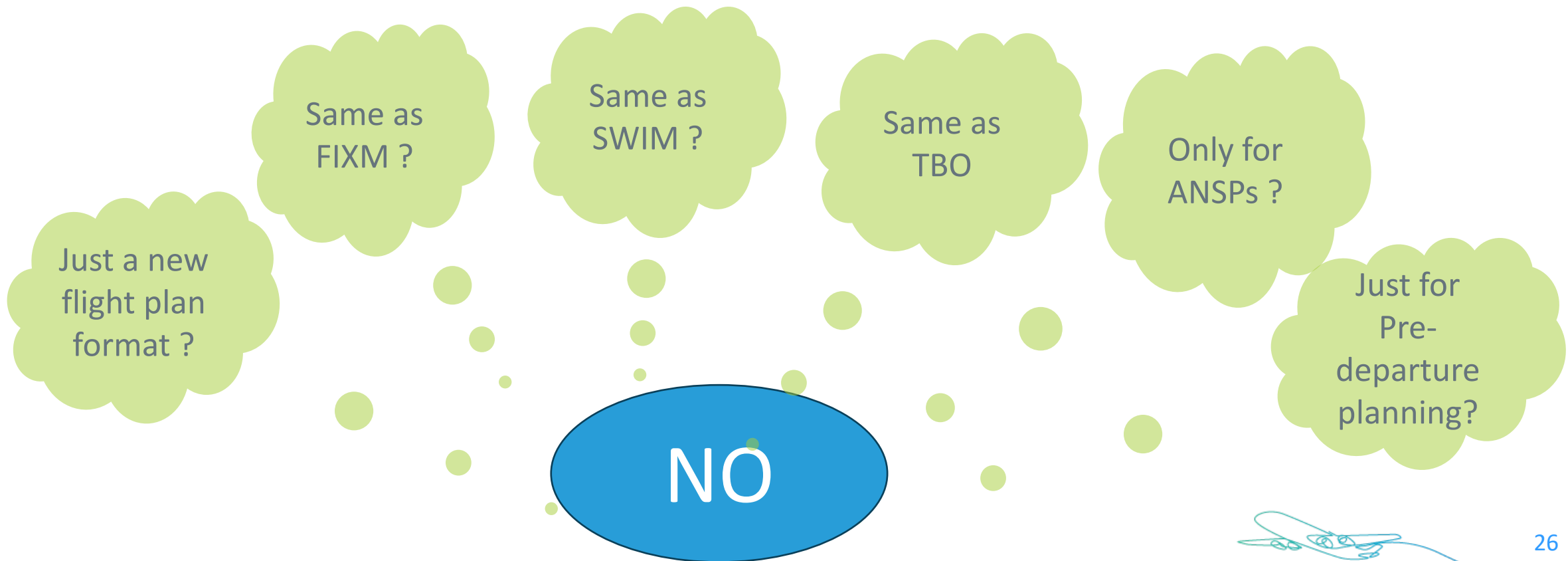
Why FF-ICE

Address limitations and constraints of the current flight planning mechanism



Enable transitioning to a fully collaborative environment where a flight trajectory is shared and optimized during all phases of a flight

Flight and **F**low - **I**nformation for a **C**ollaborative **E**nvironment (**Concept**)

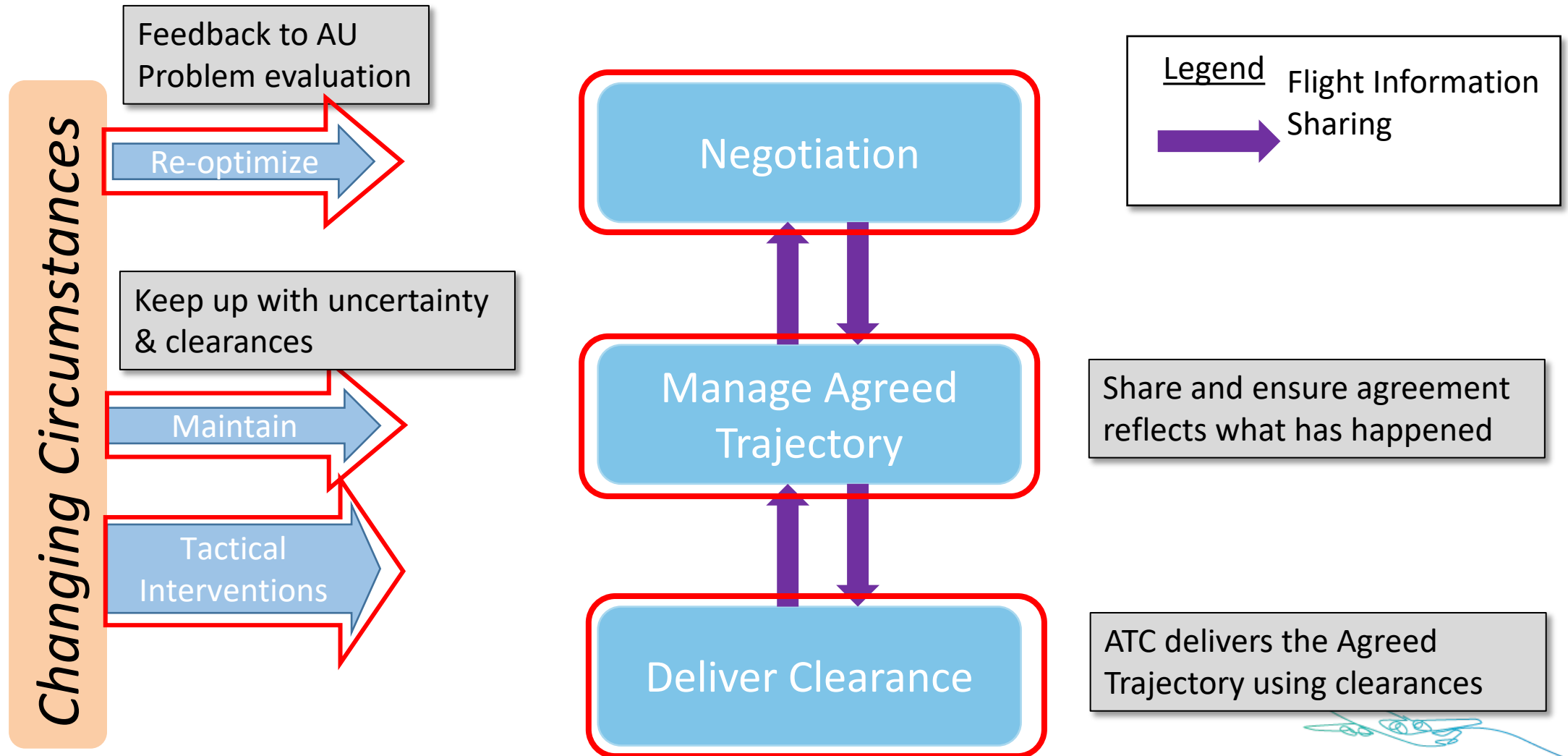


F_{light} and F_{low} - I_{nformation} for a C_{ollaborative} E_{nvironment} (Concept)



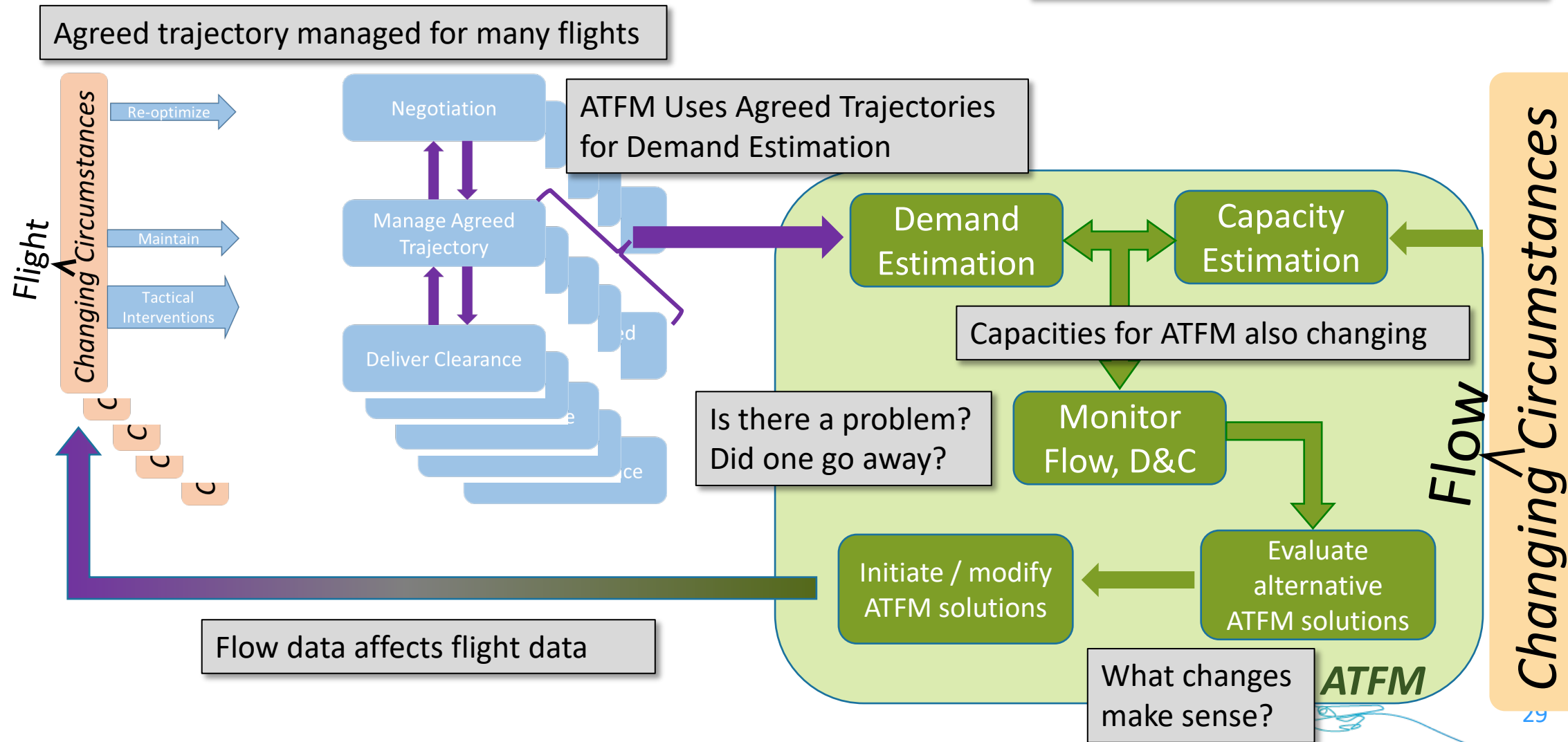
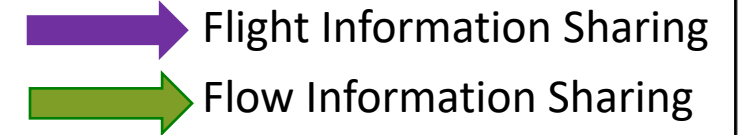
- **New data exchanges** allows indication of advanced capabilities, and is extensible to address emerging needs
- **New mechanisms** to exchange information uniquely identify flights and ensure all stakeholders work from the correct information
- **New interactions** between stakeholders facilitate coordination and negotiation

FF-ICE concept framework



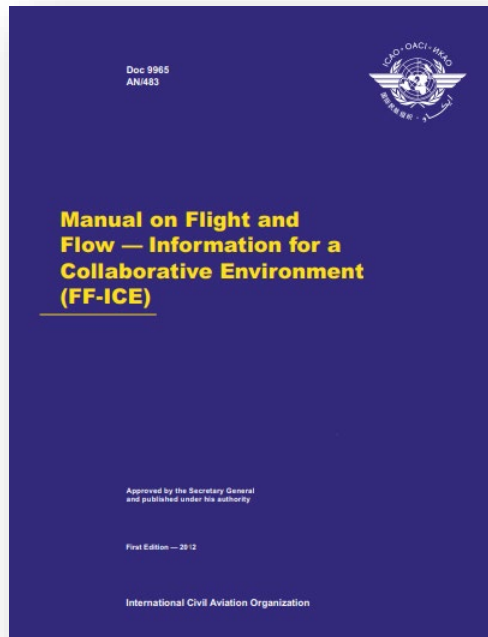
FF-ICE concept framework

Legend



Flight and **F**low - **I**nformation for a **C**ollaborative **E**nvironment **Global Endorsement**

2012 | 12th Air Navigation Conference



Describes

- Information for flow management, flight planning, and trajectory management
- Interactions between the members of the ATM community
- Globally harmonized means and process for planning and providing consistent flight information



Flight and **F**low - **I**nformation for a **C**ollaborative **E**nvironment **Deployment Planning**

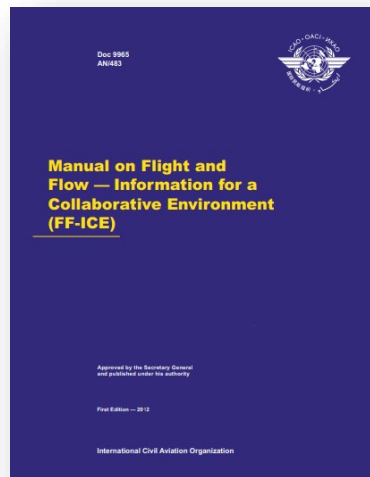


“Phased Approach (Pre-departure first then Post Departure)”



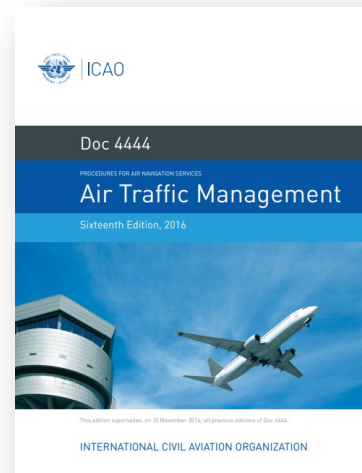
Flight and Flow - Information for a Collaborative Environment Global Provisions

Concept in 2012



Transposed
into

Services in 2024



- *Foundation for evolution*
- *focus on pre-departure*
- *elective implementation*

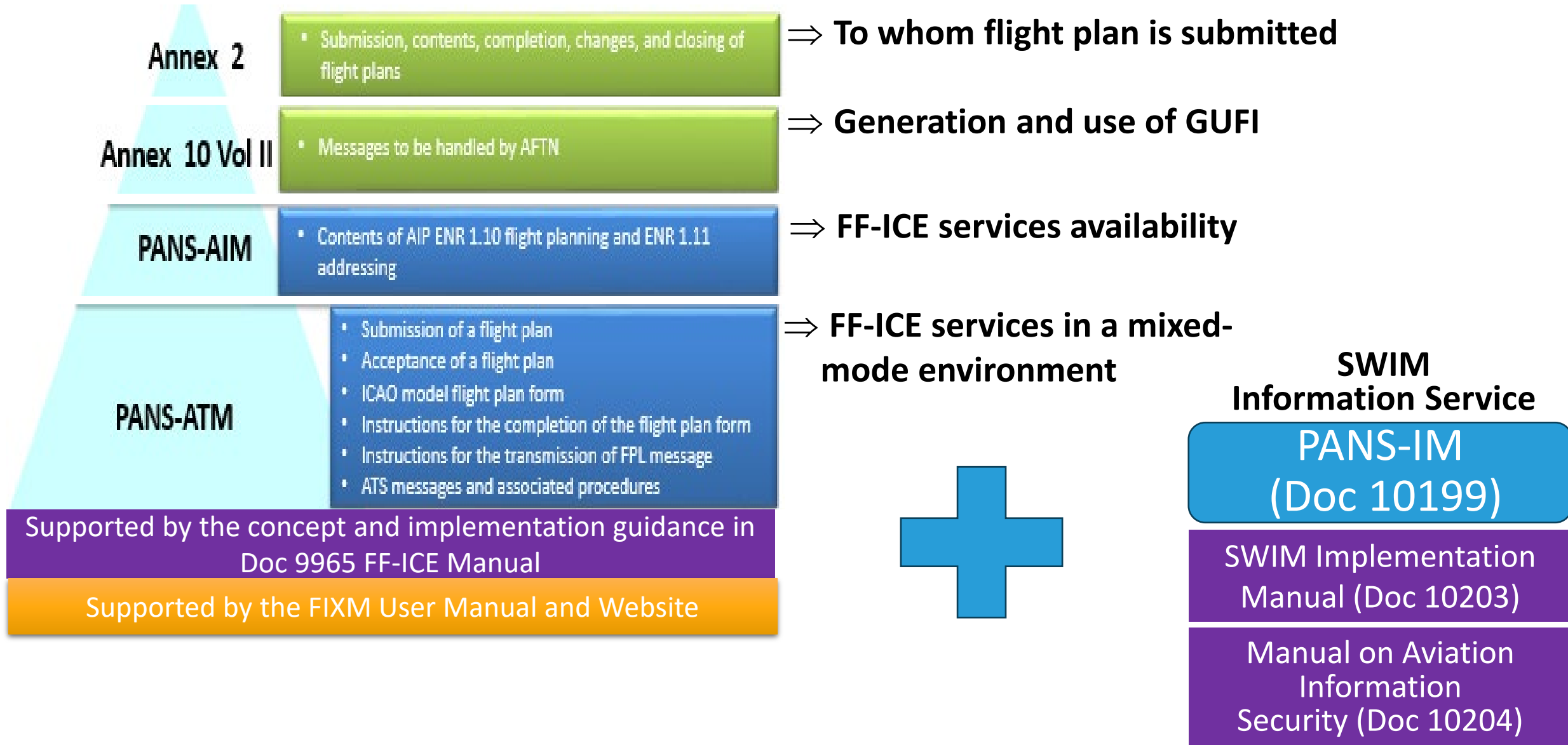
Amendment

More in 2028+

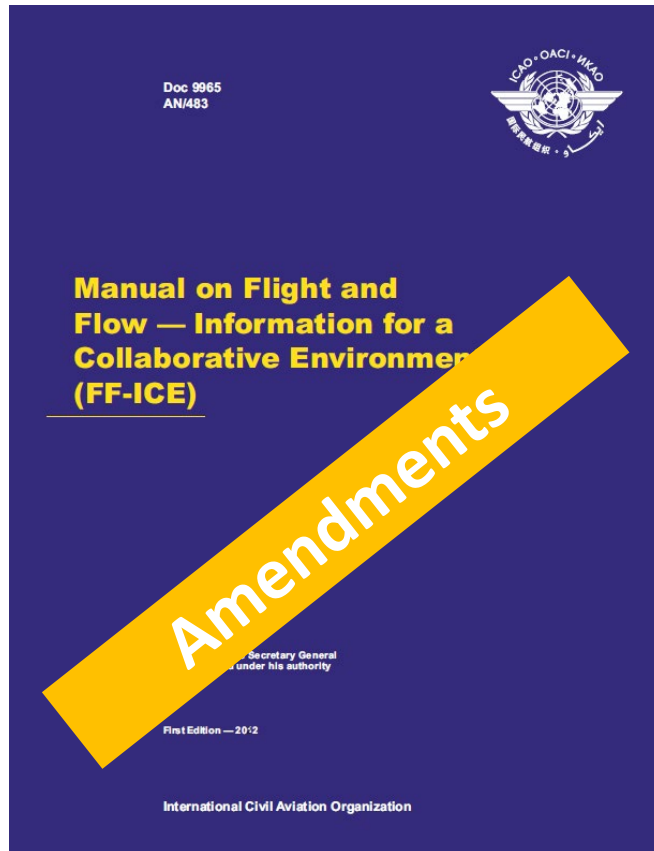


- *Mandate to replace FPL2012*
- *More details on post departure*

Overview of Provisions and Guidance



2nd Edition of Doc 9965



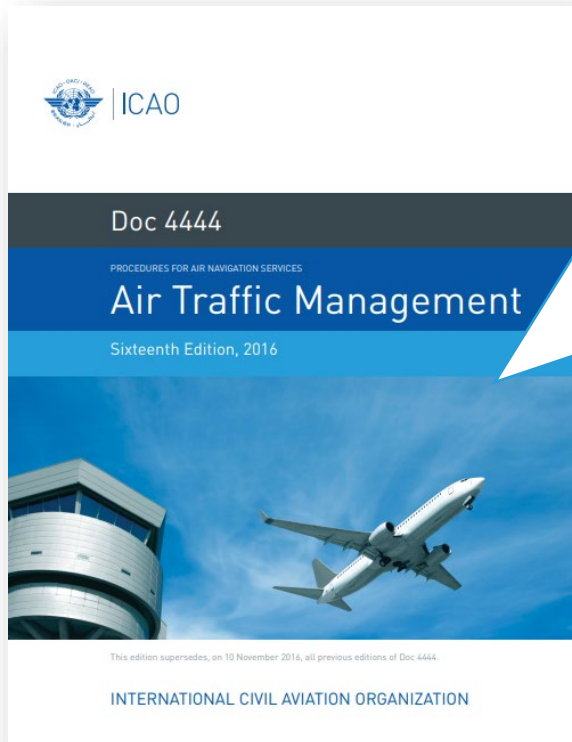
➤ Part I Concept (Updated)

➤ Part II Implementation Guidance (New)

- Implementation considerations
 - Air traffic flow and capacity management
 - Information management and technology
 - Mixed-mode and transition
 - State regulation/directives, publications and training
- GUF and flight plan association
- Detailed guidance for each FF-ICE service
- Route and trajectory information as well as other new data items
- Information and data exchange model
- Content of FF-ICE messages and translation from eFPL to FPL
- Logic rules, association checks, translation guidance



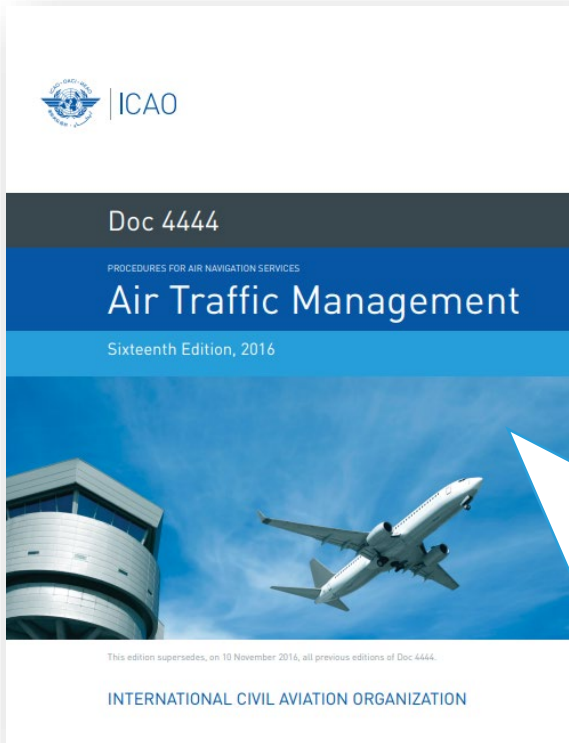
Key Definitions (1/5)



FF-ICE services

- **A set of services** established for the purposes of
 - facilitating exchange of ***FF-ICE***, accurate assessment of demands, appropriate resource planning,
 - optimizing flight planning and execution.

Key Definitions (2/5)



FF-ICE

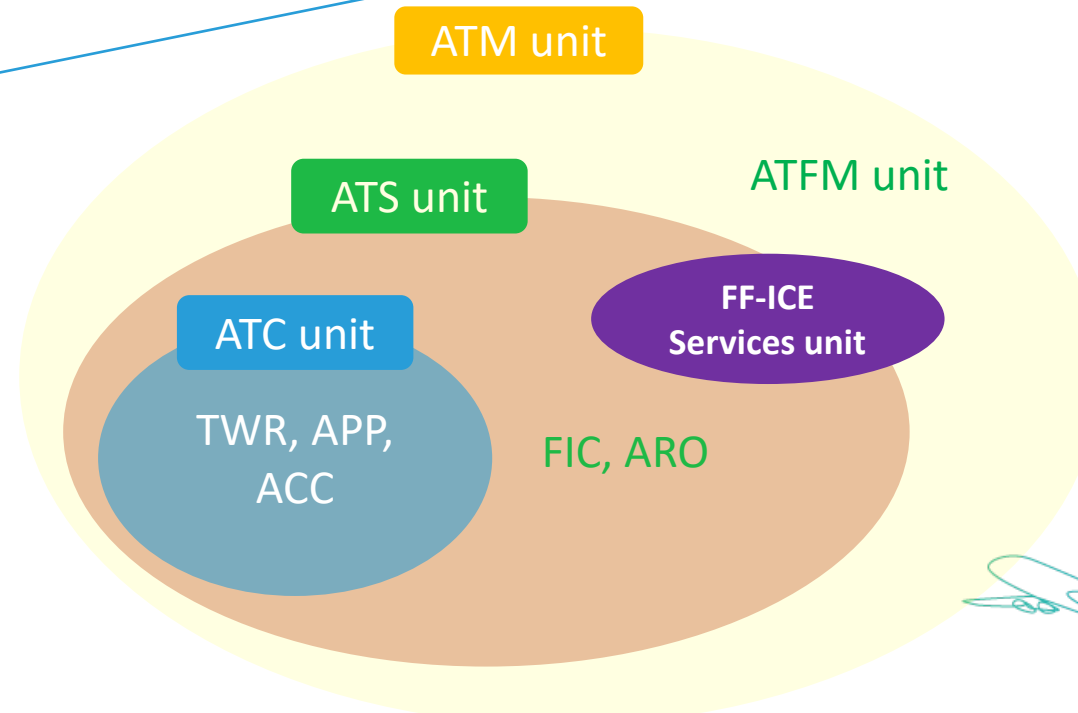
- Information

- necessary for **planning, coordination, and notification of flights,**
- exchanged between members of **the ATM community**, including those involved in flight operations and aerodrome operations.
- in a **standardized format**

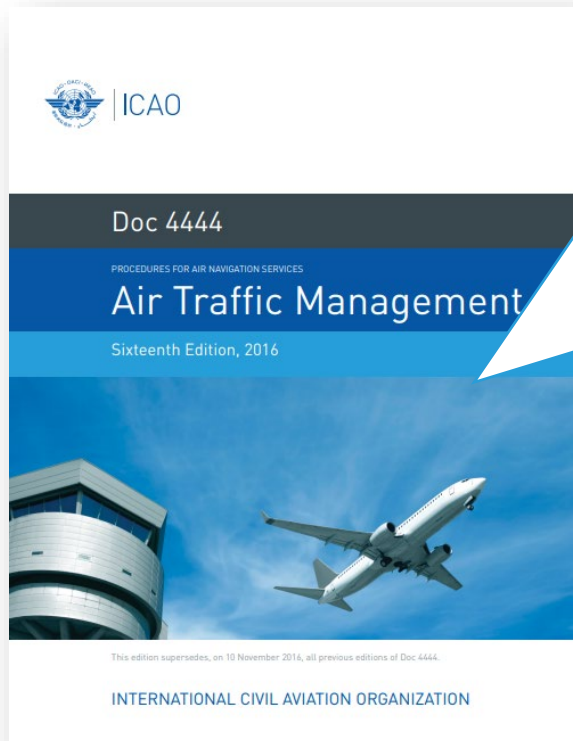
Key Definitions (3/5)

FF-ICE services unit

- A unit designated by the appropriate ATS authority for the provision of FF-ICE services.



Key Definitions (4/5)

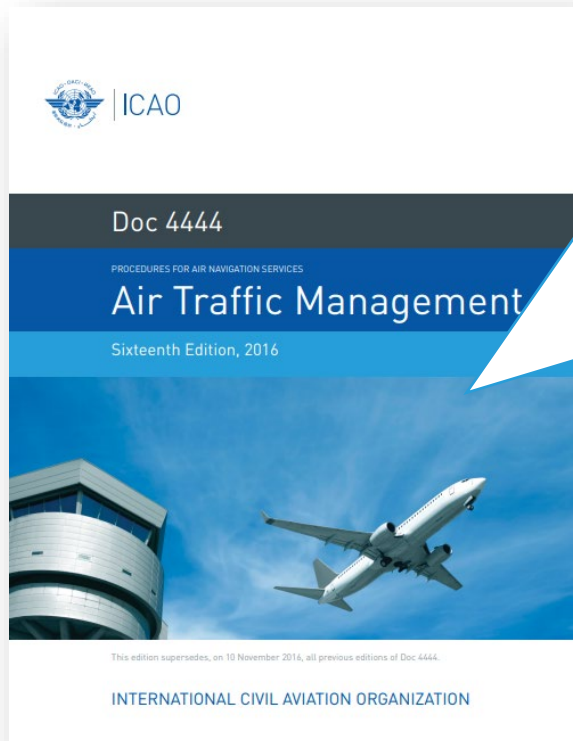


Flight plan.

Specified information relative to an intended flight or portion of a flight of an aircraft.

*Note 1.— The term flight plan may be prefixed by the words “**preliminary**”, “**filed**”, “**current**” or “**operational**” to indicate the context and different stages of a flight.*

Key Definitions (4/5)

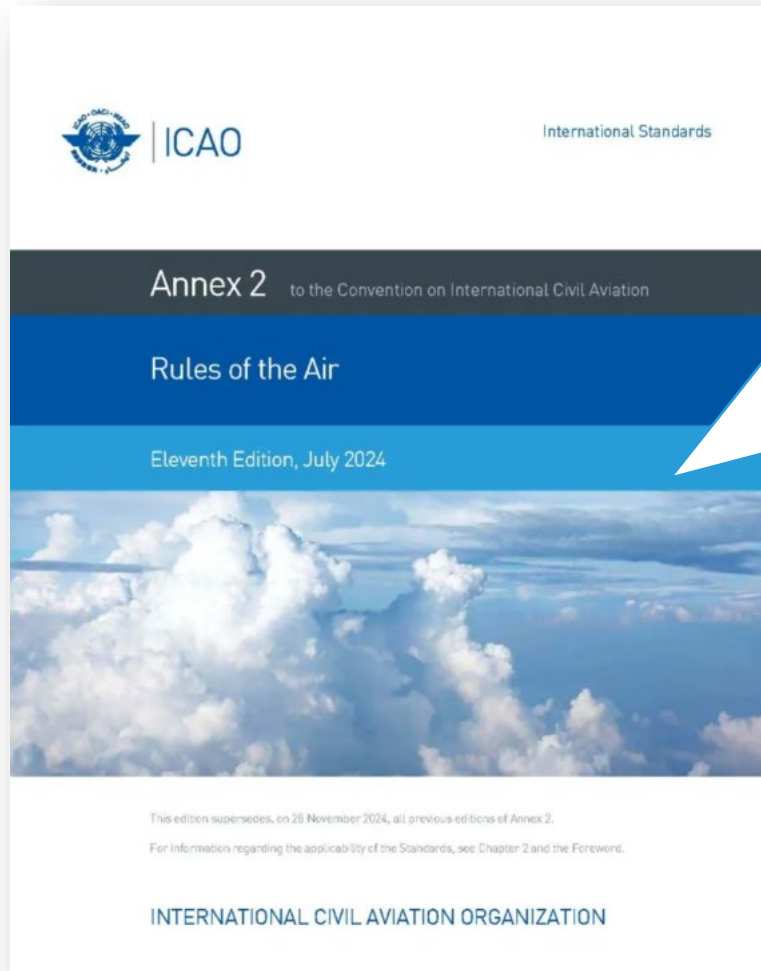


Filed flight plan (FPL or eFPL).

The latest flight plan as submitted by the pilot, an operator or a designated representative for use by ATS units.

Note.— The FPL denotes..... while eFPL denotes The eFPL allows for the exchange of additional information not contained within the FPL.

Flight plan submission/distribution - General



3.3.1.3 Unless otherwise prescribed by the appropriate ATS authority, a flight plan shall be submitted, before departure, to an air traffic services reporting office or, during flight, transmitted to the appropriate air traffic services unit or air-ground control radio station



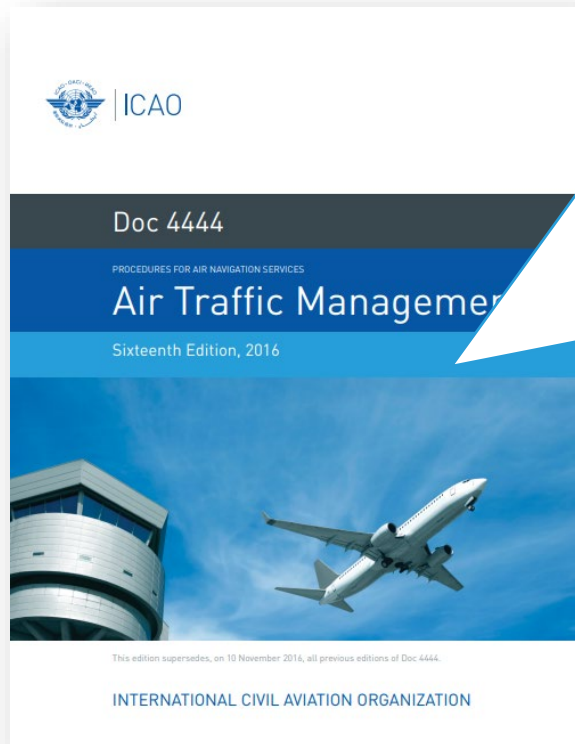
Elective Implementation of FF-ICE Services PANS-ATM

17.2 GENERAL PROVISIONS

17.2.1 When it has been determined that FF-ICE services will be provided, the appropriate ATS authority shall:

- a) designate at least one FF-ICE services unit;
- b) arrange for, as a minimum, the provision of the filing service and flight data request service;
- c) ensure that the FF-ICE services unit(s) maintains the ability necessary to exchange ATS messages with operators and ATS units that have not implemented FF-ICE services, in accordance with provisions in Chapter 11; and
- d) arrange for the promulgation of information on the availability of FF-ICE services, associated procedures and conditions in the Aeronautical Information Publications (AIP).

Flight plan submission/distribution -FPL

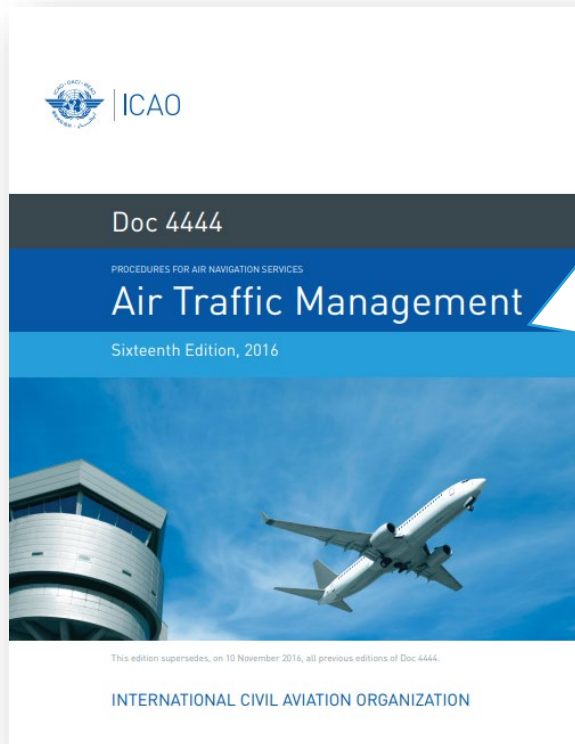


11.4.2.2.2.2 **An FPL message shall be originated** by the ATS unit serving the departure aerodrome or, when applicable, by:

- a) **a unit designated by the appropriate ATS authority** to serve the departure aerodrome;
- b) **the ATS unit** receiving a flight plan from an aircraft in flight;
or
- c) **the pilot, the operator or its designated representative**, when so delegated in accordance with 11.2.1.1.1.



Flight plan submission/distribution - eFPL

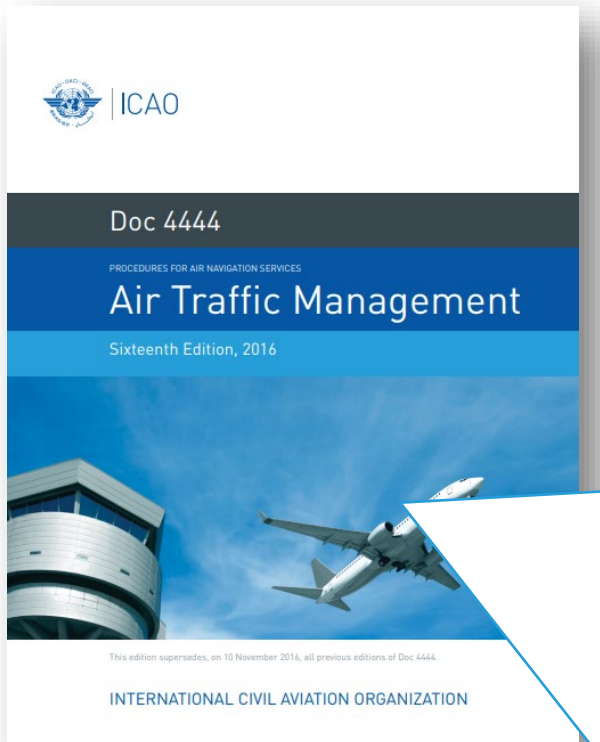


17.4.3.2 Unless otherwise prescribed by the appropriate ATS authority, **an operator or its designated representative electing to use FF-ICE services shall submit:**

- a) an eFPL to each FF-ICE services unit; and
- b) an FPL to each ATS unit unable to process an eFPL....

Note 1. The FF-ICE services unit may assume responsibility for the provision of the flight plan information and changes thereto in an appropriate format to all relevant units concerned along the route of flight....

FF-ICE services description (1/2)



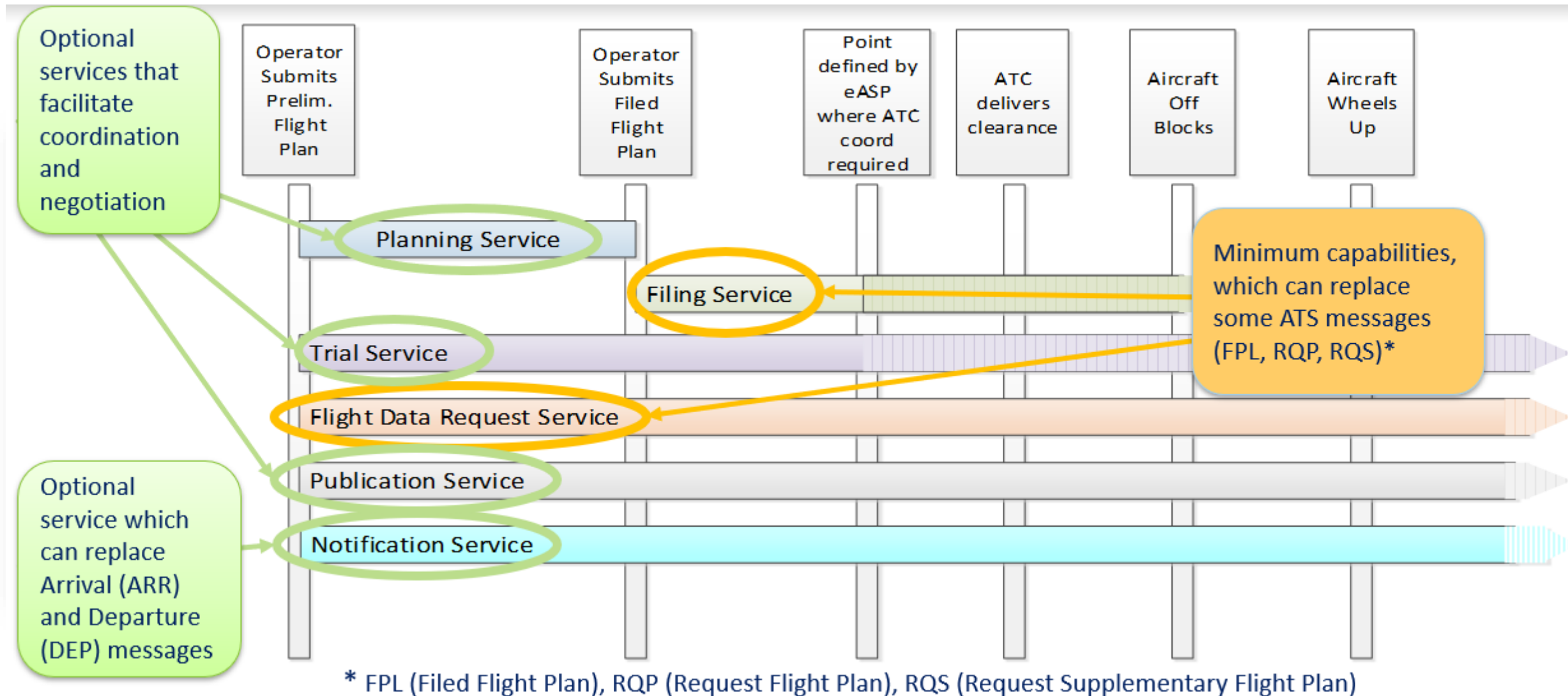
17.1.1 The FF-ICE services may include any of the following:

- a) *planning service*: the evaluation of a preliminary flight plan (PFP) with respect to flight plan acceptability and, where practicable, the indication of applicable restrictions and resultant constraints on the flight;
- b) *filing service*: the evaluation of a filed flight plan (eFPL) for the provision of air traffic services and indication of flight plan acceptability;
- c) *trial service*: the evaluation of a trial request with respect to flight plan acceptability and, where practicable, the indication of applicable restrictions and resultant constraints on the flight;

Note.— The trial service offers an opportunity for an operator or designated representative to submit “what-if” scenarios and to receive feedback from an FF-ICE services unit, prior to submitting a PFP, eFPL or flight plan update.

- d) *flight data request service*: the provision of data regarding a specific flight such as the latest version of a filed flight plan or search and rescue data upon request by an eligible recipient;
- e) *notification service*: the provision of data regarding a certain flight event such as departure and arrival to required recipients; and
- f) *publication service*: the publication of flight and flow data for access by authorized subscribers.

FF-ICE services description (2/2)



Standard FF-ICE Messages

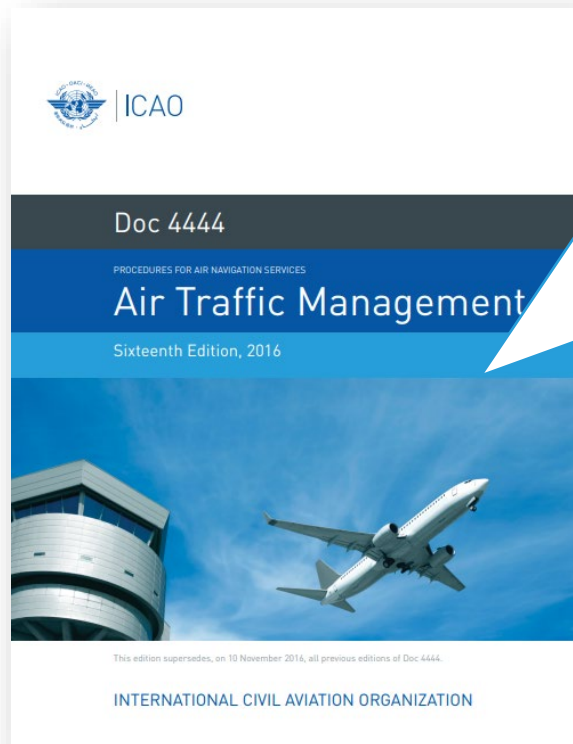
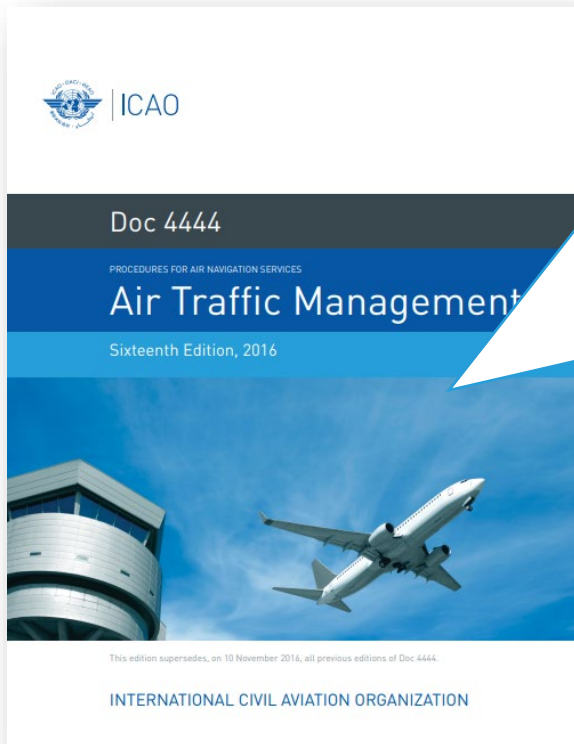


Table 17-1

- Submission response
- Preliminary flight plan
- Planning status
- Trial request
- Trial response
- Filed flight plan (eFPL)
- Fling status
- Flight plan update
- Flight plan cancellation
- Flight data request
- Flight data response
- Flight departure
- Flight arrival

FF-ICE Services Procedures – Examples (1/2)



17.4.1.3 Each recipient shall respond to each of the messages identified below **with a Submission Response message...**

17.4.5.1 Each individual FF-ICE services unit shall determine the acceptability of the flight plan or flight plan update, and **send an appropriate FF-ICE message** (Planning Status message or Filing Status message) ...as soon as practicable.

FF-ICE Services Procedures – Examples (2/2)



17.4.1.6 The originator of PFP, eFPL or Flight Plan Update messages **shall include flight plan version** information
....

17.4.3.3 **An eFPL message shall include**, as a minimum, **the GUF**I and the flight data items prescribed by the provisions in Annex 2, 3.3.2 and Appendix 2 of this document.



Standard FF-ICE Messages

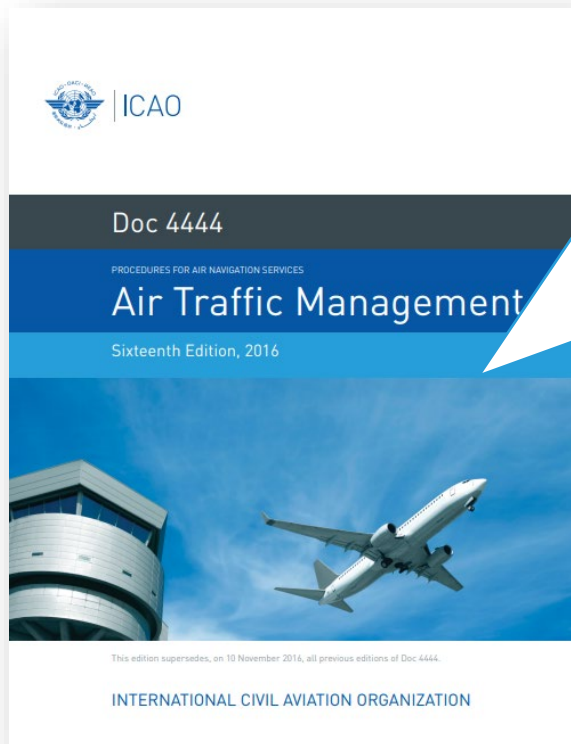
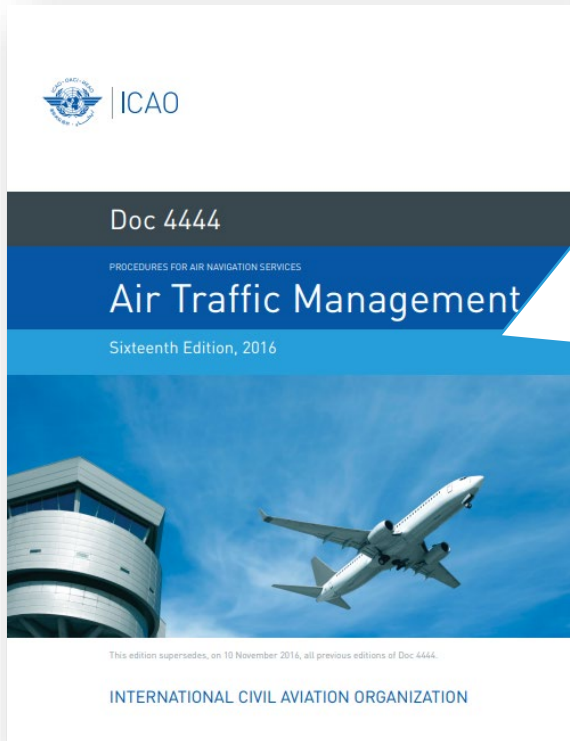


Table 17-1

- Submission response
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- Flight data response
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- Flight arrival

Technical and Interoperability Requirement (1/3)



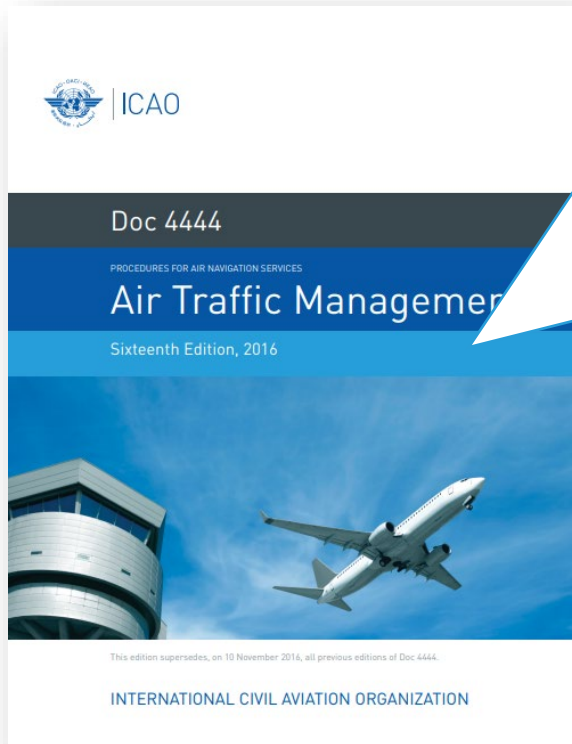
17.5.1 FF-ICE services shall make use of information services.

*Note 1. — In the context of system-wide information management, the information service addresses **machine-to-machine interaction in a service-oriented architecture**.*

*Note 2. — Procedures on information services are contained in the Procedures for Air Navigation Services - Information Management (**PANS-IM, Doc 10199**).*



Technical and Interoperability Requirement (2/3)



17.5.2 ... **shall adopt an information exchange model** that :

- a) **provides the structure and format** of the required flight and flow data elements,
- b) **enables the construction and exchange** of the standard FF-ICE messages
- c) **provides a mechanism** by which additional flight and flow data and/or FF-ICE messages can be used without affecting global interoperability.



Technical and Interoperability Requirement (3/3)



3.9 Globally unique flight identifier

3.9.1 The originator of a preliminary flight plan (PFP) or eFPL **shall assign a single GUF**I to a flight for which the flight plan is to be submitted.

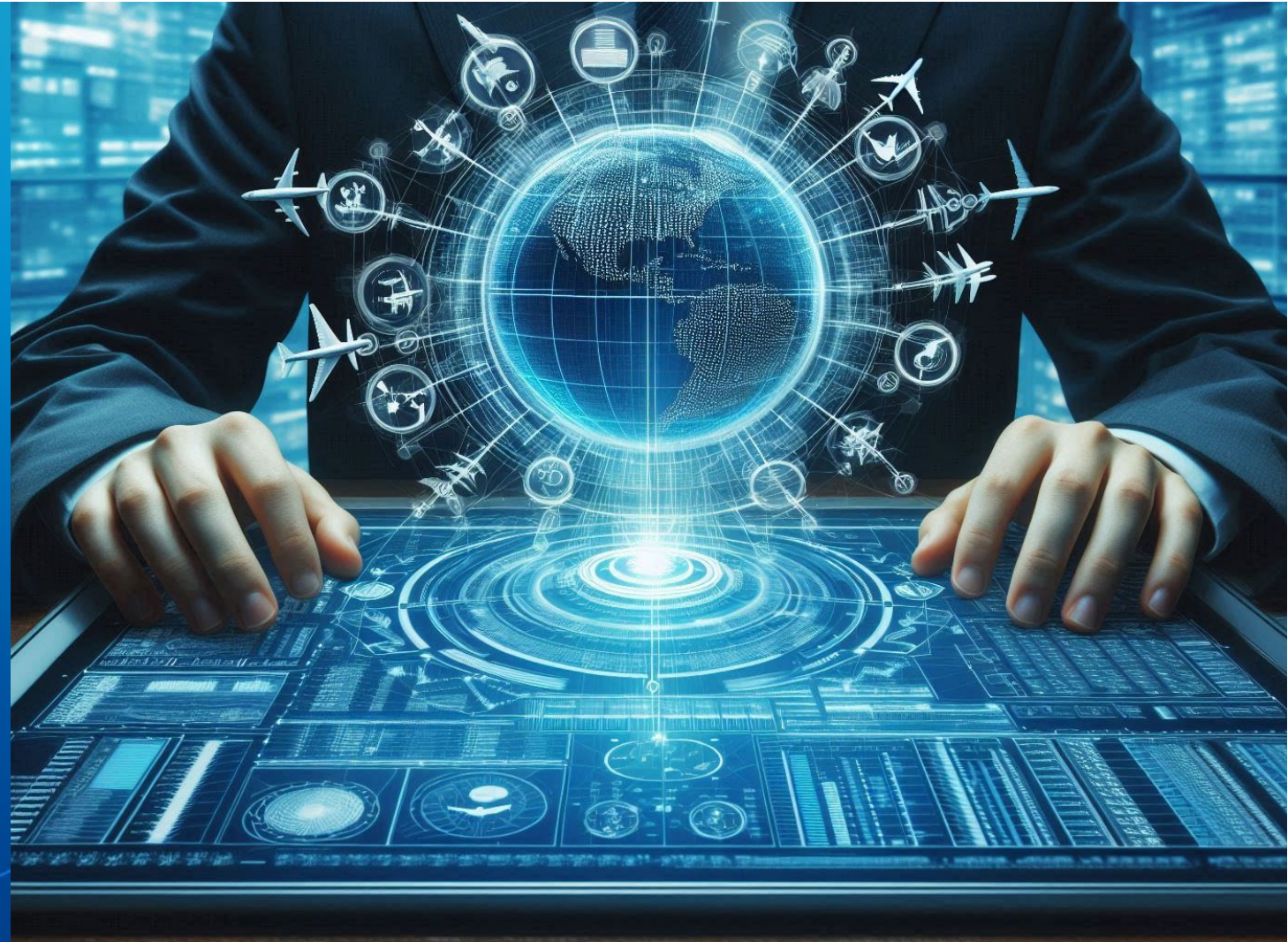
3.9.2 The originator of a PFP or eFPL shall ensure that **all FF-ICE messages** submitted for a flight are **identified by the same GUF**I.

.....



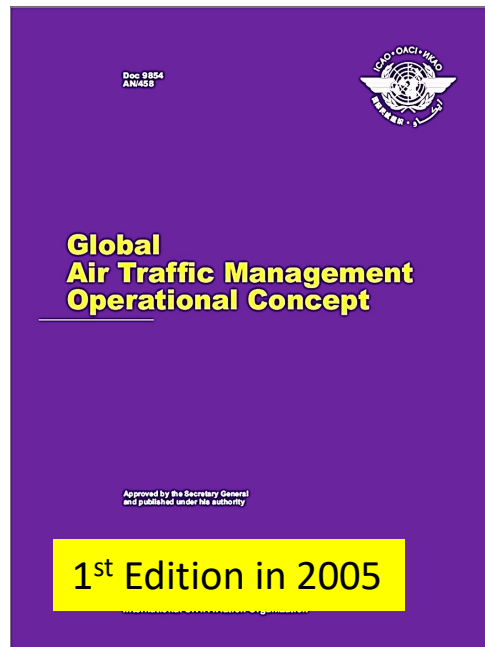
06

Global ATM Operational Concept (Doc 9854)



Role of the Concept since 2005

01

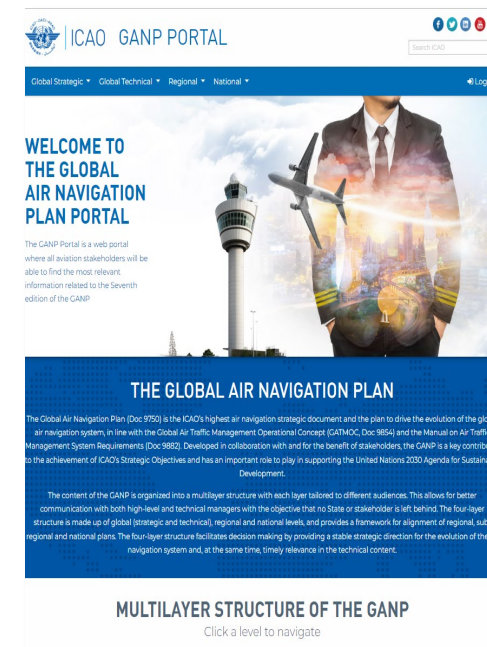


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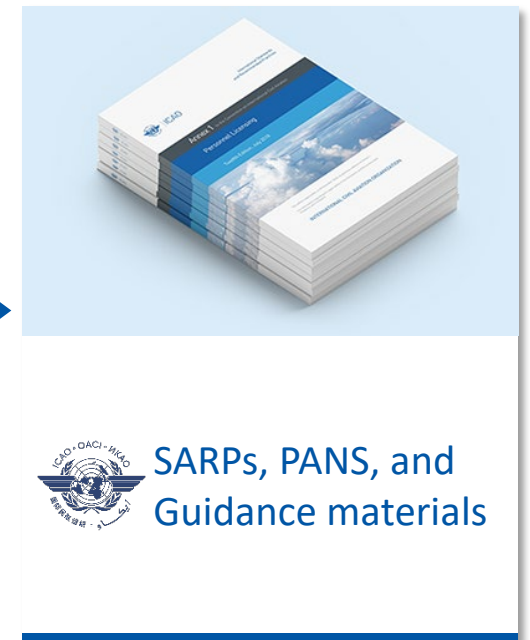
Detailed concepts & performance framework

- CDM/ATFM
 - FF-ICE
 - SWIM
 - TBO
 - Connected Aircraft
-
- ATM System Requirements
 - Global Air Navigation System Performance

03



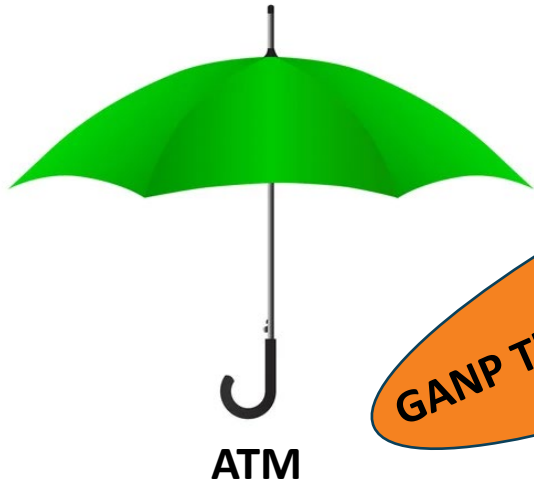
04



Relationship with the GANP

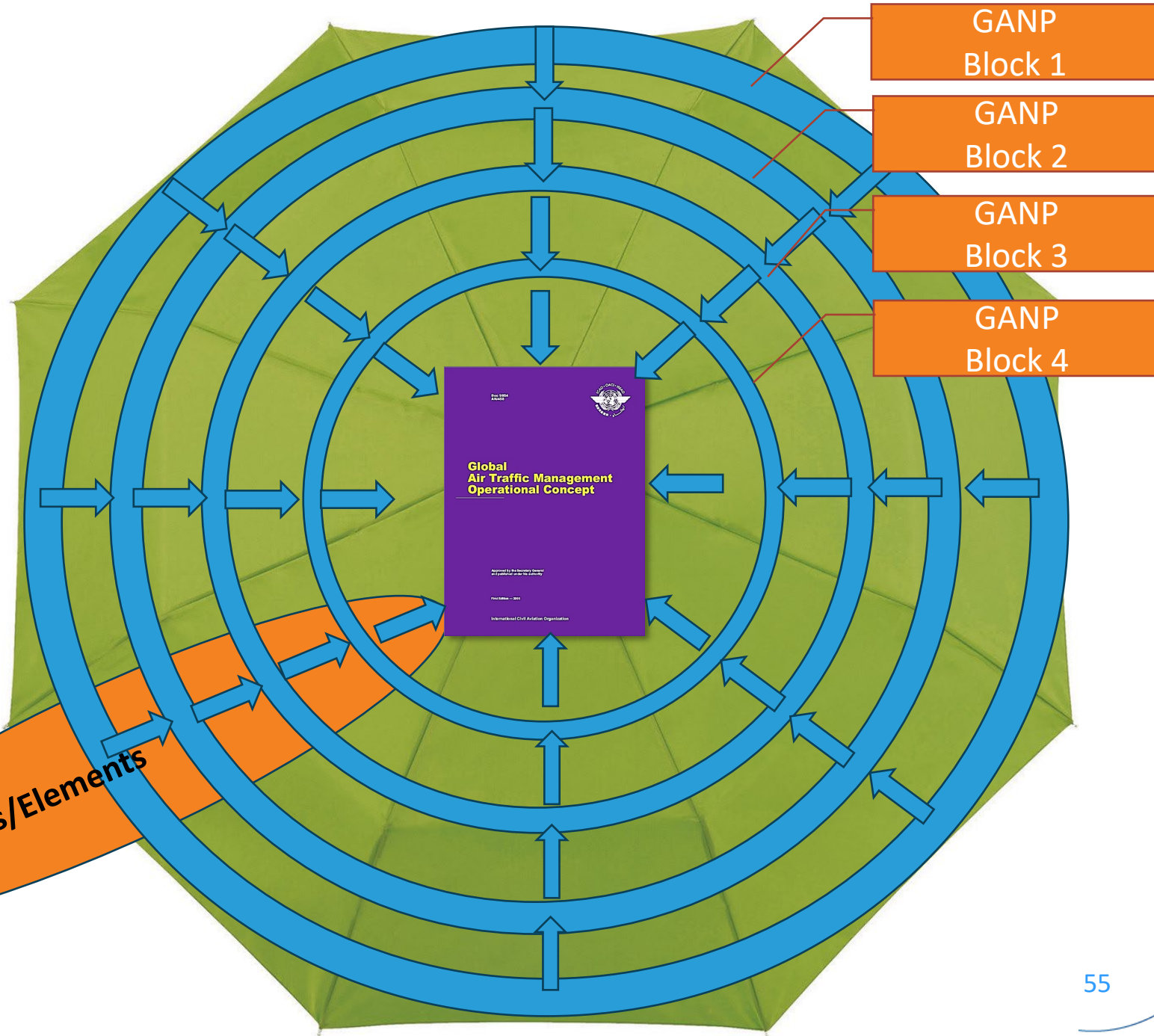


Direction/orientation
2050

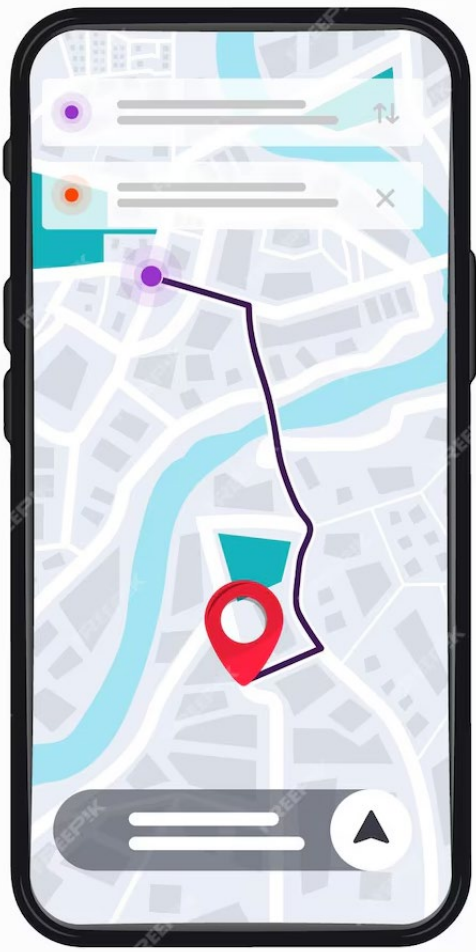


ATM

GANP Threads/Elements



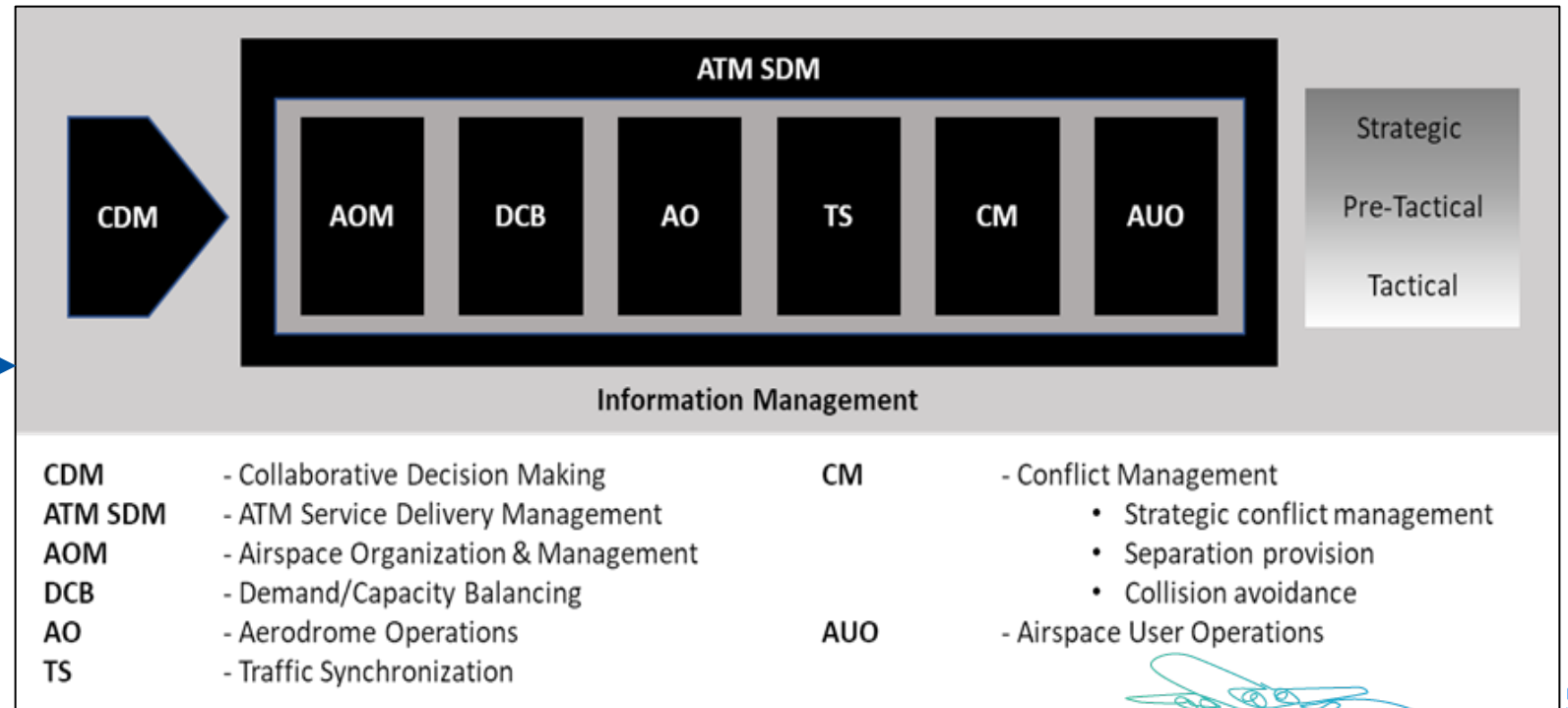
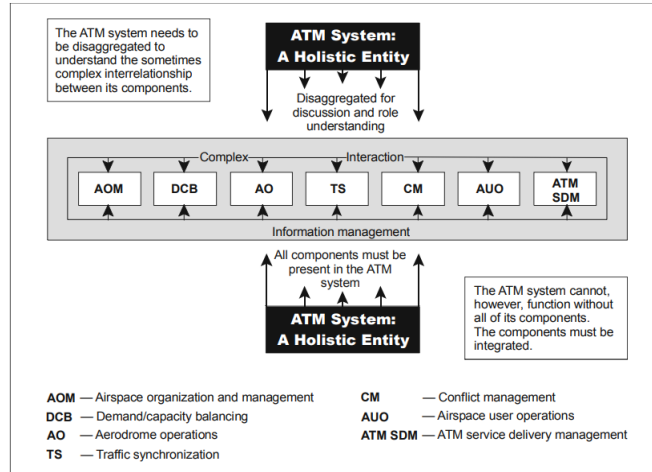
— Let's try applying the concept on the ground!



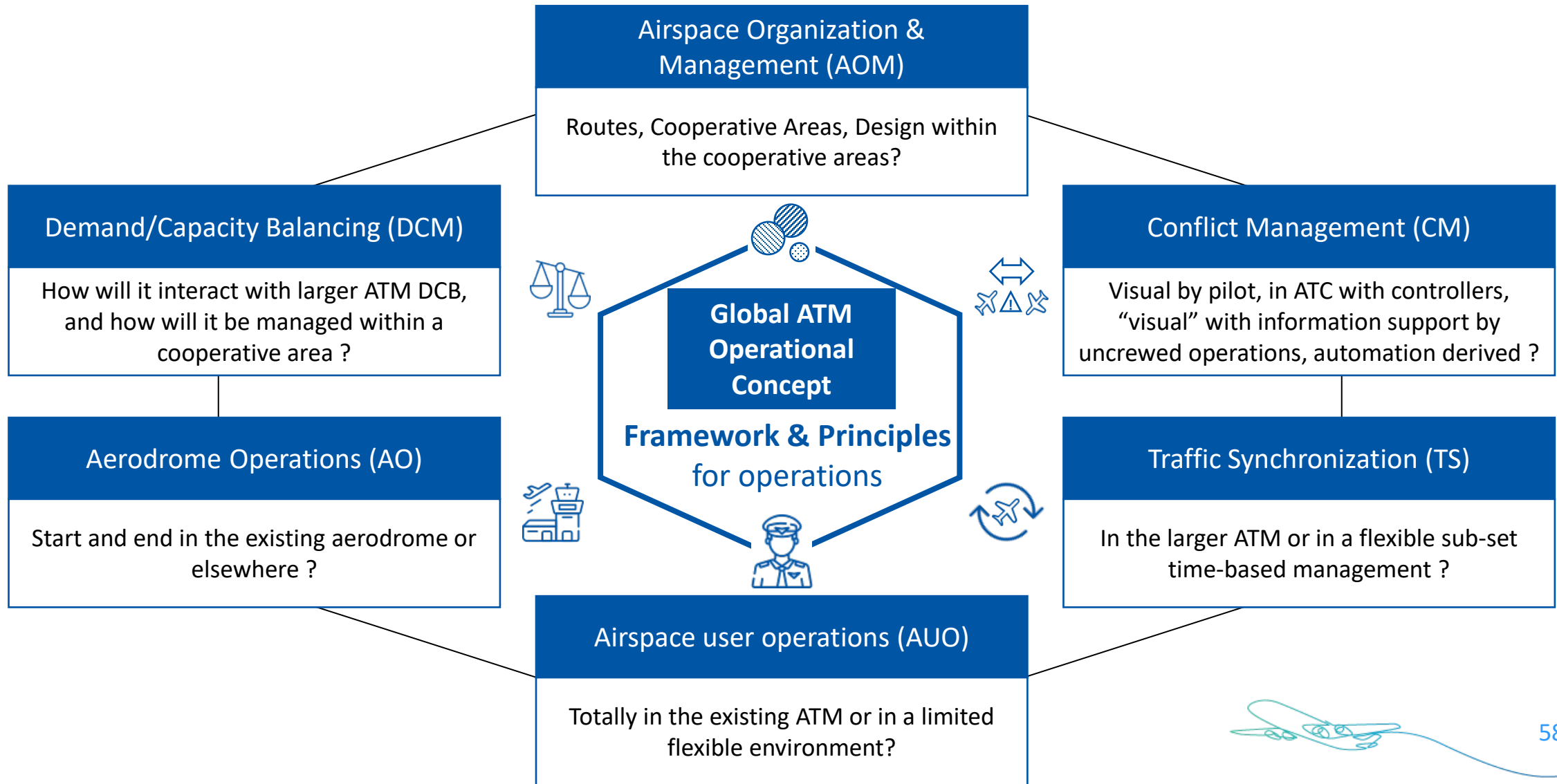
- Accuracy and Reliability
- Real-time Traffic Updates
- Intuitive User Interface
- Detailed Maps
- Turn-by-Turn Directions
- Adaptability to Changes
- Offline Capabilities
- Additional Features
- Airspace Organization & Management (AOM)
- Conflict Management (CM)
- Traffic Synchronization (TS)
- Airspace user operations (AUO)
- Aerodrome Operations (AO)
- Demand/Capacity Balancing (DCM)



Update to the Concept Components



Relationship with Concept(s) for New Entrants



Action by the Meeting:

The meeting is invited to:

- a) consider the air navigation global developments and the relevant Recommendations of AN-Conf/14 when discussing the MIDANPIRG work programme;
- b) agree on the necessary measures for the implementation of project 30/10, ATFM, SWIM, FF-ICE and report any perceived challenges that would delay the implementation;
- c) agree on the development and implementation of the MID Regional ATM Contingency Management Framework, in line with the global initiative; and
- d) invite MID States to participate in the ICAO AFI/MID CIV-MIL Cooperation and Contingency Management Workshop, supported by HQ, tentatively planned from Q3 2025.



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Thank You

