



ICAO

الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY



ATM SG/11 & CNS SG/14

19-23 Oct. 2025 **MEETINGS** Abu Dhabi, UAE



FF-ICE implementation Workshop

Presented by the Secretariat





ICAO



Global TBO Concept

- Broad support from the 13th Air Navigation Conference (Montreal, 9 – 19 October 2018)
- Integrated in the Global Air Navigation Plan and Aviation System Block Upgrade Framework
- Higher Performance is achieved
 - Trajectory Based Operations (TBO) is the Concept which is implemented through ATM processes
 - Using Flight and Flow Information for a Collaborative Environment (FF-ICE) processed
 - Utilizing System Wide Information Management (SWIM) services



Flight and Flow Information for a *Collaborative* Environment (FF-ICE)

Address limitations and constraints of the current flight planning mechanism

Long Term

Short Term

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

Form Approved OMB No. 0704-0188
2010-08-01

International Flight Plan

FAA Form 723 (Rev. 10-2009)

1. **PRIOIRITY** **cc** **FF** **ADDRESS/REUSE** _____

2. **PLANE TIME** _____ **ORIGINATOR** _____ **CR**

3. **SPONSOR IDENTIFICATION OF ADDRESS/REUSE AND/OR ORIGINATOR** _____

4. **EMERGENCY TYPE** **1** **2** **3** **4** **5** **6** **7** **8** **9** **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **30** **31** **32** **33** **34** **35** **36** **37** **38** **39** **40** **41** **42** **43** **44** **45** **46** **47** **48** **49** **50** **51** **52** **53** **54** **55** **56** **57** **58** **59** **60** **61** **62** **63** **64** **65** **66** **67** **68** **69** **70** **71** **72** **73** **74** **75** **76** **77** **78** **79** **80** **81** **82** **83** **84** **85** **86** **87** **88** **89** **90** **91** **92** **93** **94** **95** **96** **97** **98** **99** **00** **01** **02** **03** **04** **05** **06** **07** **08** **09** **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **30** **31** **32** **33** **34** **35** **36** **37** **38** **39** **40** **41** **42** **43** **44** **45** **46** **47** **48** **49** **50** **51** **52** **53** **54** **55** **56** **57** **58** **59** **60** **61** **62** **63** **64** **65** **66** **67** **68** **69** **70** **71** **72** **73** **74** **75** **76** **77** **78** **79** **80** **81** **82** **83** **84** **85** **86** **87** **88** **89** **90** **91** **92** **93** **94** **95** **96** **97** **98** **99** **00** **01** **02** **03** **04** **05** **06** **07** **08** **09** **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **30** **31** **32** **33** **34** **35** **36** **37** **38** **39** **40** **41** **42** **43** **44** **45** **46** **47** **48** **49** **50** **51** **52** **53** **54** **55** **56** **57** **58** **59** **60** **61** **62** **63** **64** **65** **66** **67** **68** **69** **70** **71** **72** **73** **74** **75** **76** **77** **78** **79** **80** **81** **82** **83** **84** **85** **86** **87** **88** **89** **90** **91** **92** **93** **94** **95** **96** **97** **98** **99** **00** **01** **02** **03** **04** **05** **06** **07** **08** **09** **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **30** **31** **32** **33** **34** **35** **36** **37** **38** **39** **40** **41** **42** **43** **44** **45** **46** **47** **48** **49** **50** **51** **52** **53** **54** **55** **56** **57** **58** **59** **60** **61** **62** **63** **64** **65** **66** **67** **68** **69** **70** **71** **72** **73** **74** **75** **76** **77** **78** **79** **80** **81** **82** **83** **84** **85** **86** **87** **88** **89** **90** **91** **92** **93** **94** **95** **96** **97** **98** **99** **00** **01** **02** **03** **04** **05** **06** **07** **08** **09** **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **30** **31** **32** **33** **34** **35** **36** **37** **38** **39** **40** **41** **42** **43** **44** **45** **46** **47** **48** **49** **50** **51** **52** **53** **54** **55** **56** **57** **58** **59** **60** **61** **62** **63** **64** **65** **66** **67** **68** **69** **70** **71** **72** **73** **74** **75** **76** **77** **78** **79** **80** **81** **82** **83** **84** **8**

2034

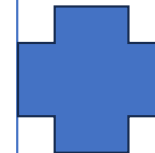
[illegible]

During FF-ICE Provision Development (2015~2018)

Within ATMRPP



- How to accommodate additional information needs ?
- How to manage mixed-mode operations ?
- Will FPL2012 be sun-setting eventually, if so when ?



AN-Conf/13 in 2018

Recommendation
3.2/2 FF-ICE

...

b) ICAO develop a
robust transition
strategy.....

14th Air Navigation Conference (ANConf/14), Recommendation 3.2/2 – Transition to flight and flow – information for a collaborative environment services and cessation of ICAO 2012 flight plan by 2034

That States:

- a) in support of the 2034 global cessation of the ICAO 2012 flight plan, commence the development of a national plan to transition to flight and flow – information for a collaborative environment services along with industry stakeholders;
- b) include plans for the implementation of both minimum and optional flight and flow – information for a collaborative environment services in the national air navigation plans;
- c) share experience and resources for the implementation of flight and flow – information for a collaborative environment services;
- d) and planning and implementation regional groups, consider establishing regional focus groups for coordinating the planning and implementation of flight and flow – information for a collaborative environment services and providing necessary support throughout the transition period; and
- e) support and contribute to the work of their respective planning and implementation regional group and their sub-groups to develop a regional plan to transition to flight and flow – information for a collaborative environment services on the basis of the 2034 global cessation of the ICAO 2012 flight plan;

...



14th Air Navigation Conference (ANConf/14), Recommendation 3.2/2 – Transition to flight and flow – information for a collaborative environment services and cessation of ICAO 2012 flight plan by 2034

....

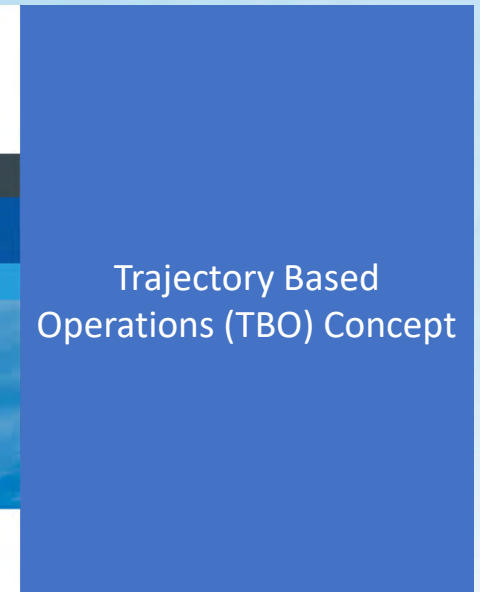
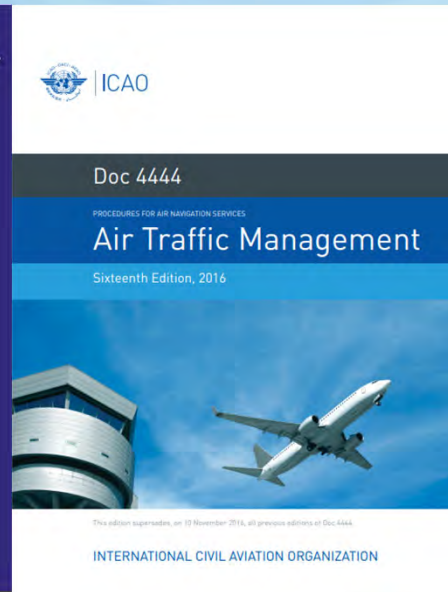
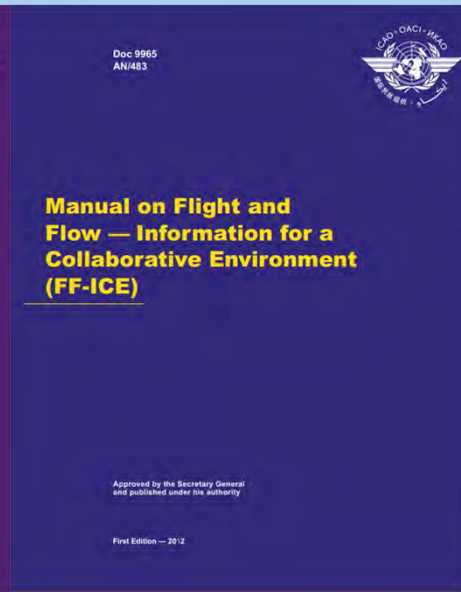
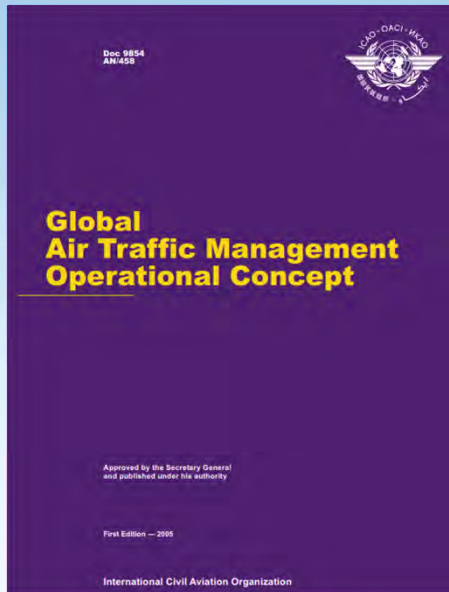
that ICAO:

- f) amend relevant ICAO provisions and guidance material to enable the 2034 global cessation of the ICAO flight plan and associated air traffic services messages;
- g) through planning and implementation regional groups, provide guidance and support for the development of regional plans to transition to flight and flow – information for a collaborative environment to enable the 2034 global cessation of the ICAO 2012 flight plan;
- h) support inter-regional collaboration for a harmonized implementation of and transition to flight and flow – information for a collaborative environment services;
- i) monitor and support the progress of flight and flow – information for a collaborative environment services implementation and transition plan developments of States; and
- j) conduct a periodic assessment and report on the readiness of the global air traffic management community for the 2034 global cessation of the ICAO 2012 flight plan.





ICAO



ATM SG/11 Meeting

Transition Strategy Development

Top Down

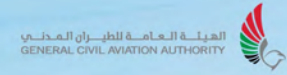
- Engage and raise awareness all stakeholders
- Deliver ICAO provisions and guidance both for FF-ICE and SWIM
- No more changes to FPL2012 requirements
- Set the global target date for sunseting FPL2012

Bottom Up

- Engagement on national and regional levels and demonstrations or tabletop exercises
- National/regional Implementation transition plan



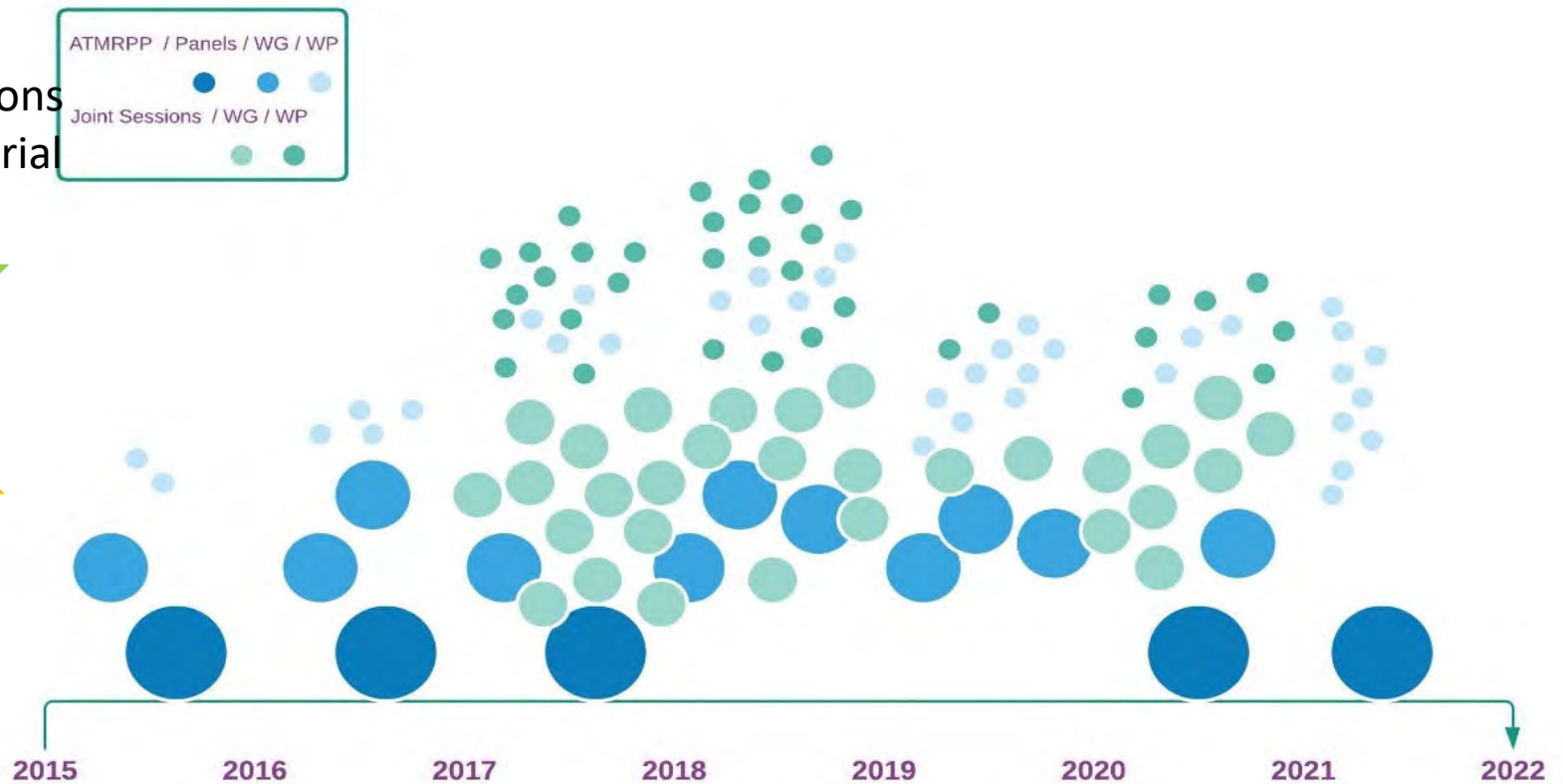
ICAO



Transition Strategy of FF-ICE Provision Development

Draft Global Provisions
and Guidance material

Discussed/
Tested by States
and Regions





ICAO



Deliverables

TTX / trials / demos
from Q1/2021

Elaboration and Execution of FF-ICE/R1 regional transition plans
from Q1/2024

States begin
implementation
of FF-ICE/R1
Q1 2025

Applicability
of FF-ICE/R1
Q4 2024

ICAO to cease
amendments to
provisions concerning
FPL 2012
Q4 2027

Regional sunset
of FPL 2012
Q4 2032

Global sunset
of FPL 2012
Q4 2034



ATM SG/11 Meeting

Global Level (Up to 2024)

Top Down



Global Awareness & Engagement



Global Provisions Adopted/Approved



Global Consensus on 2034 Cessation of FPL2012



AN-Conf/14 REC 3.2/2 (Up to 2034)



**Determine
an ultimate
cut-off date**



- **amend relevant ICAO provisions and guidance material** to enable the 2034 global cessation of the ICAO flight plan and associated air traffic services messages;
 - **conduct a periodic assessment and report on the readiness** of the global air traffic management community for the 2034 global cessation of the ICAO 2012 flight plan.
-
- **development of national and regional plan(s)** to transition to FF-ICE services along with industry stakeholders
 - **establishment of regional focus groups** for coordinating the planning and implementation of FF-ICE services and providing necessary support throughout the transition period
 - **inter-regional collaboration** for a harmonized implementation of and transition to FF-ICE services;



ICAO



Ongoing Regional Activities

**AFI FF-ICE Project,
ToR and Project
Document endorsed
by APIRG**

**Establishing FF-ICE
EUR Task Force under
EASPG**

**ASM WG under
MIDANPIRG ATM
SG**

**Developing CAR/SAM
Transition Plan for
GREPASCAS review in
2025**

**FF-ICE Ad-hoc WG
under APANPIRG
ATMWG**



Flight Plan 2012 Challenges & Constraints

- Current ICAO FPL2012 format has limited fields for content, approaching capacity.
- Limited fields in FPL2012 mean valuable additional information can not be submitted, without that information, ANSPs have less data to use for optimizing airspace capacity.
- FPL2012 doesn't permit pre-flight negotiation of preferred trajectory.
- Frequently rejected due inaccurate analysis.
- Doesn't easily enable inflight replanning.
- Need for local agents and lack of centralized automation.
- Ad-hoc flight approvals, and require manual process.
- Expectation that all ANSPs would transition to FPL2012, a number of ANSPs took a long time to adopt (some still haven't fully); which raises concerns.



Flight Plan 2012 Challenges & Constraints

- In complex environment where ATFM provisions are essential, additional data would aid flow management units to better predict actual trajectories and hence optimize flow management releasing capacity.
- Regional/fragmented implementation brings operational and safety concerns especially for global carriers.
- ANSP uses default aircraft performance/wind data to estimate flight profile.
- Because the planning system does not have actual aircraft performance, weather data, etc the estimated flight profile differs significantly from the calculations of the airline Flight Planning tool, resulting that FPL is rejected unnecessarily.



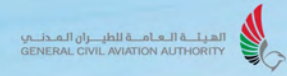
Summary

- Current FPL2012 is becoming unable to accommodate necessary information.
- Capacity for more information required to enable improved trajectory and planning for demand vs capacity balancing.
- Flight planning processed needs to be simplified and automated.
- All inclusive transition plan (not similar to the program of FPL2012).





ICAO



The solution

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





ICAO



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

Same as
FIXM ?

Same as
SWIM ?

Same as
TBO

Only for
ANSPs ?

Just a new
flight plan
format?

Just for
Pre-
departure
planning?

NO, it is
FF-ICE





ICAO



Flight and Flow - Information for a Collaborative Environment (Concept)



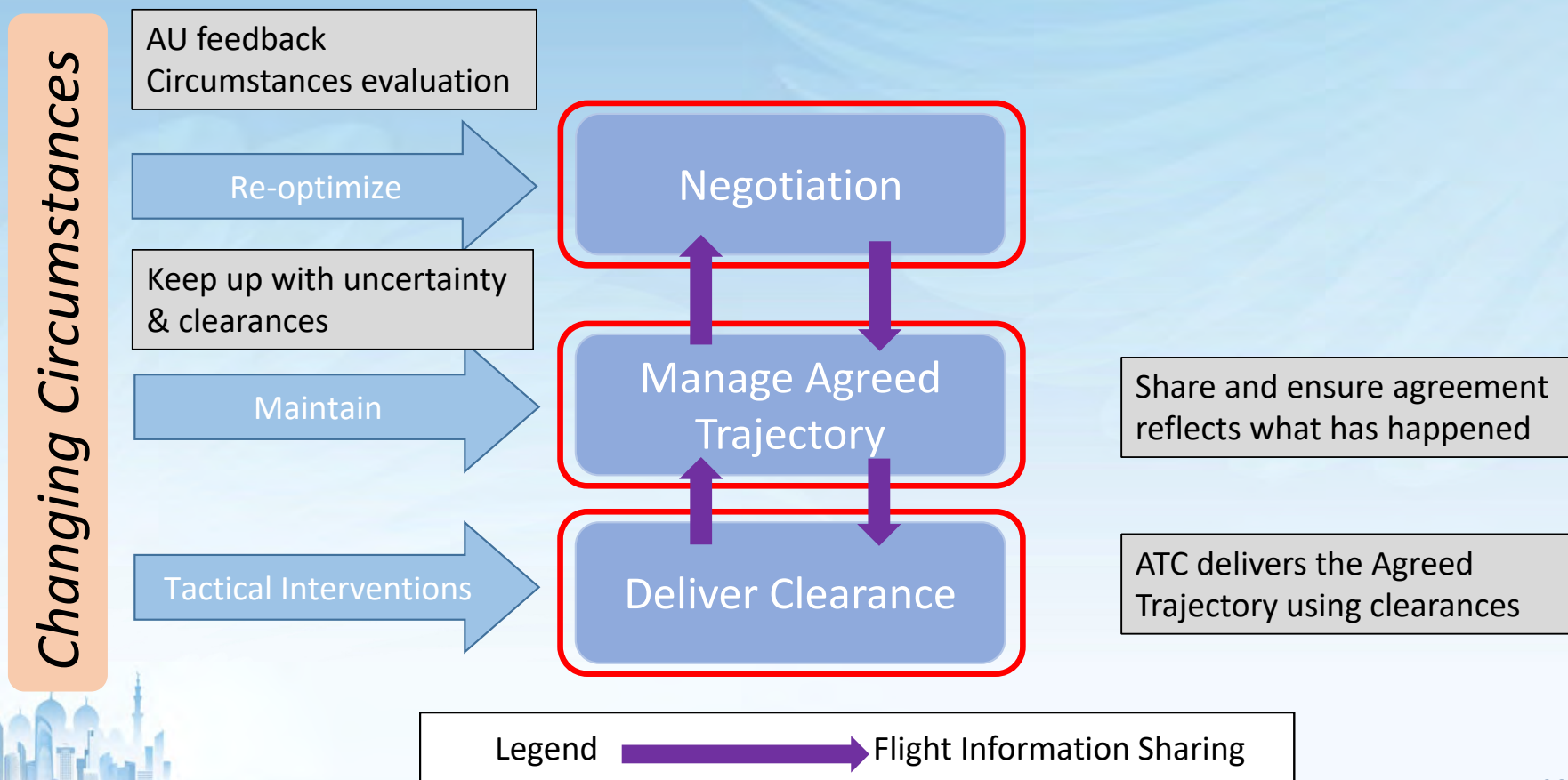
- **New data exchanges** allows indication of advanced capabilities, and is extensible to address emerging needs
- **New mechanisms** to exchange information uniquely identify flights and ensure all stakeholders work from the correct information
- **New interactions** between stakeholders to facilitate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



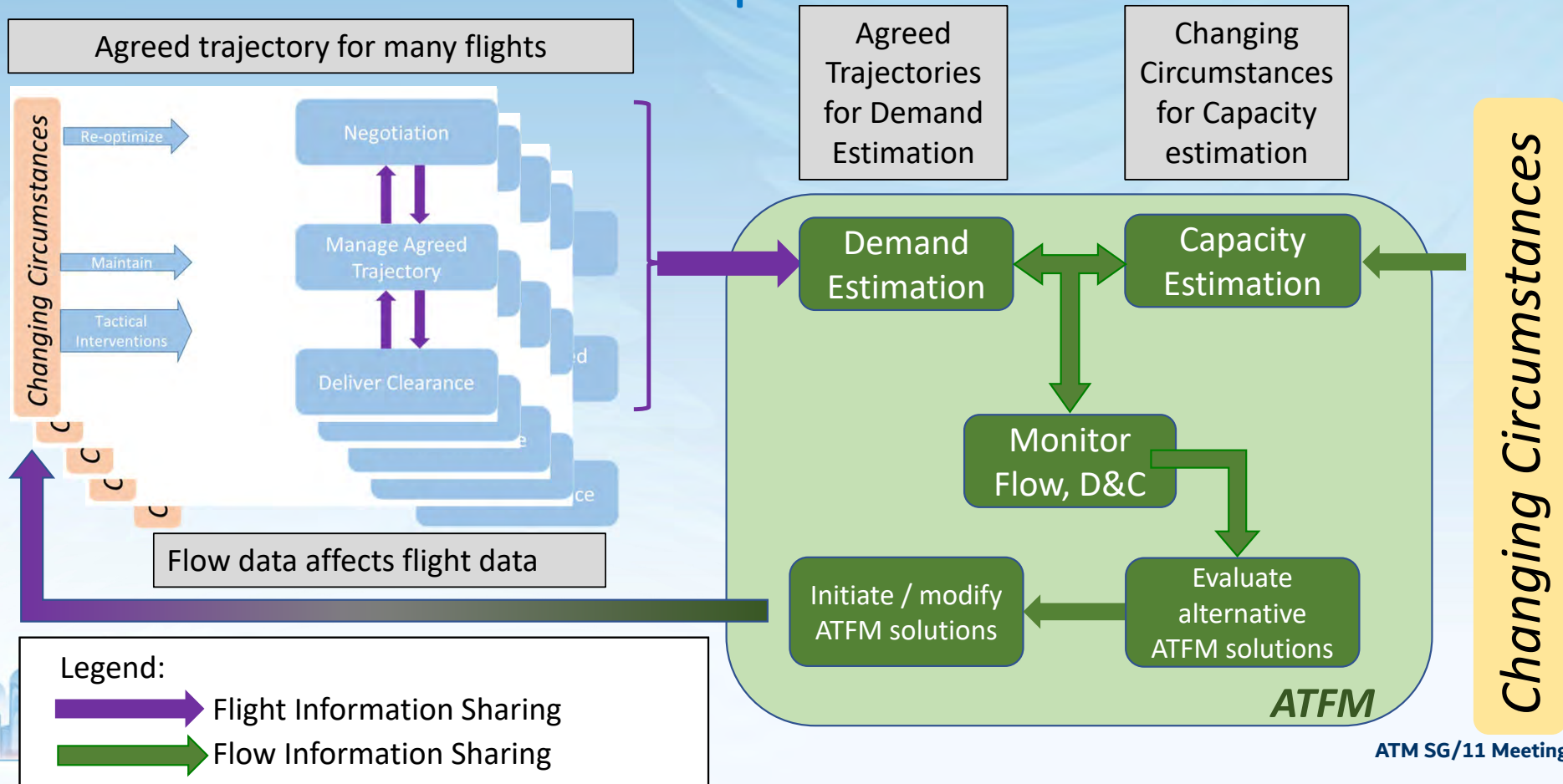
ICAO



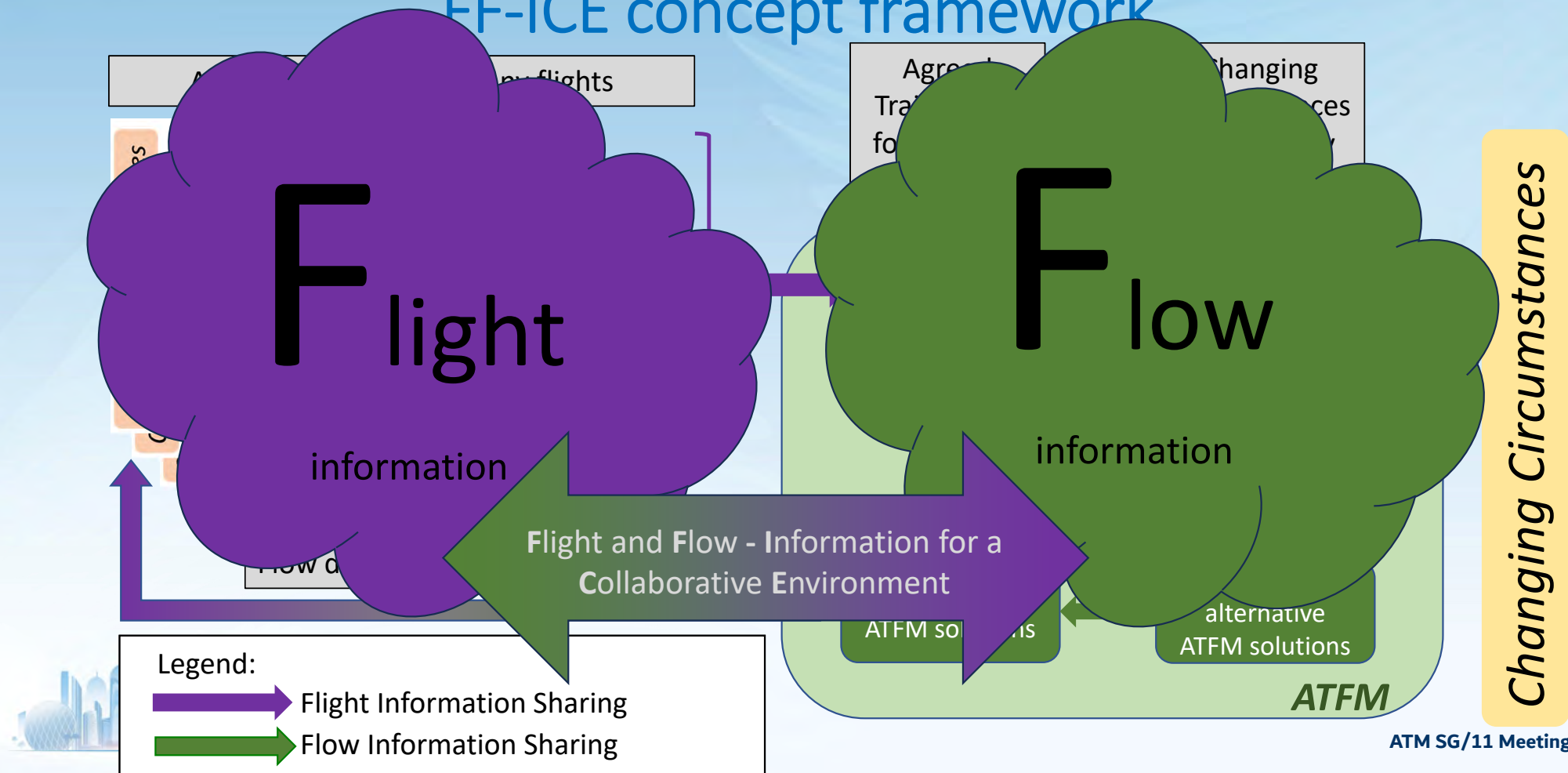
FF-ICE concept framework



FF-ICE concept framework



FF-ICE concept framework



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

Global Endorsement

2012 | 12th Air Navigation Conference

Doc 9965
AN/453



**Manual on Flight and
Flow — Information for a
Collaborative Environment
(FF-ICE)**

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

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

Deployment Planning

4th Edition, 2013



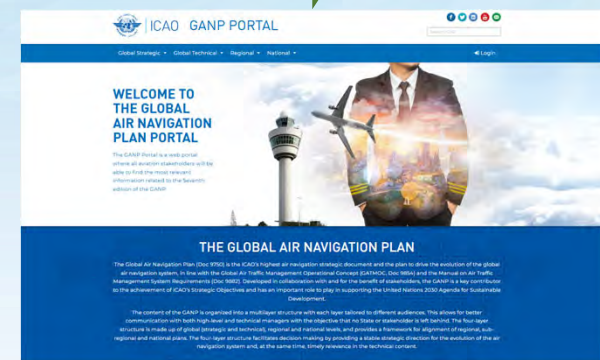
5th Edition, 2013



6th Edition, 2019



7th Edition, 2022

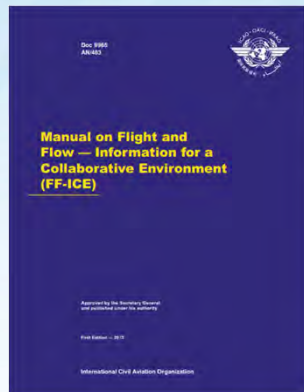


“Phased Approach (Pre-departure first then Post Departure)”

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

Global Provisions

Concept in 2012



Transposed
into

Services in 2024



Amendment

More in 2028+



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





ICAO



Overview of Provisions and Guidance material

Annex 2

- Submission, contents, completion, changes, and closing of flight plans

⇒ To whom flight plan is submitted

Annex 10 Vol II

- Messages to be handled by AFTN

⇒ Generation and use of GUFi

PANS-AIM

- Contents of AIP ENR 1.10 flight planning and ENR 1.11 addressing

⇒ FF-ICE services availability

PANS-ATM

- Submission of a flight plan
- Acceptance of a flight plan
- ICAO model flight plan form
- Instructions for the completion of the flight plan form
- Instructions for the transmission of FPL message
- ATS messages and associated procedures

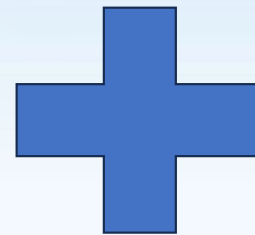
⇒ FF-ICE services in a mixed-mode environment

Supported by the concept and implementation guidance in Doc 9965 FF-ICE Manual

Supported by the FIXM User Manual



GUFi: Globally Unique Flight Identifier
FIXM: Flight Information Exchange Mode



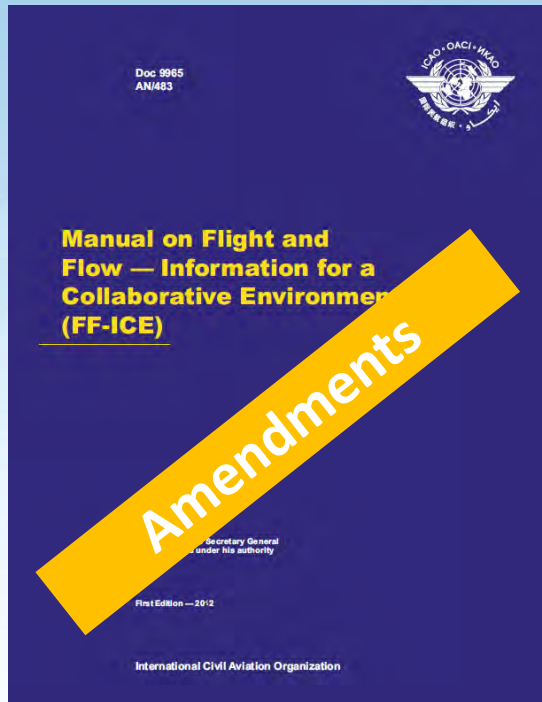
SWIM Service

PANS-IM
(Doc 10199)

SWIM Implementation
Manual (Doc 10203)

Manual on Aviation
Information
Security (Doc 10204)

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
- GUFI 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**

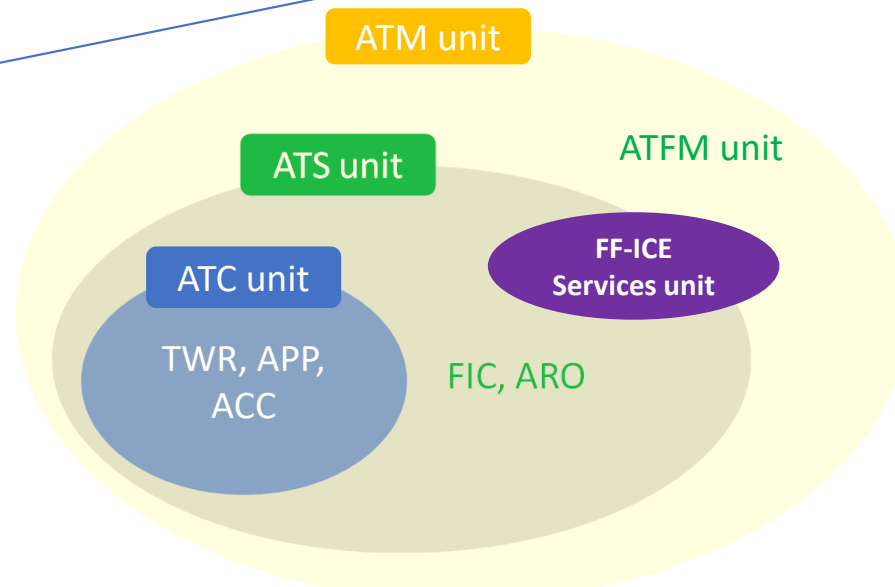
- necessary for **planning, coordination, and notification of flights**,
- exchanged between members of **the ATM community**, including those involved in flight operations and aerodrome operations.
- in a **standardized format**



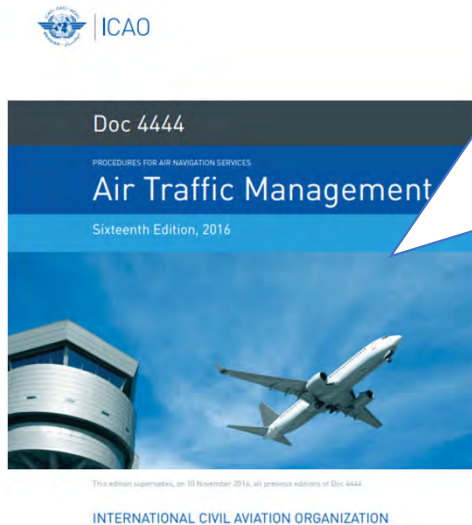
Key Definitions (2/5)

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 (5/5)

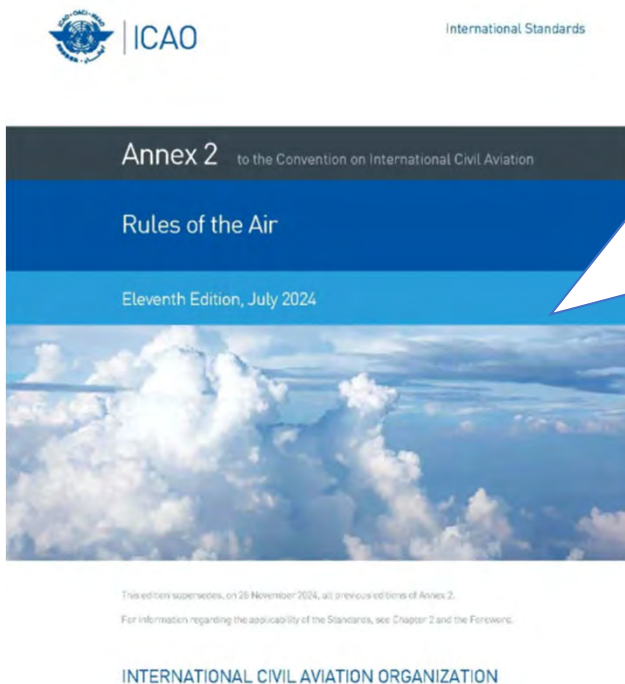


Filed flight plan (FPL or eFPL).

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

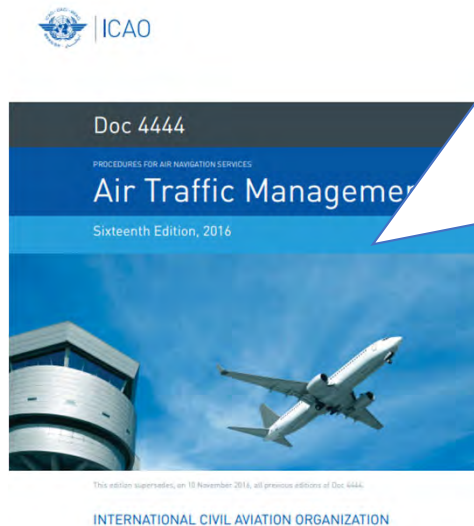
PANS-ATM

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).

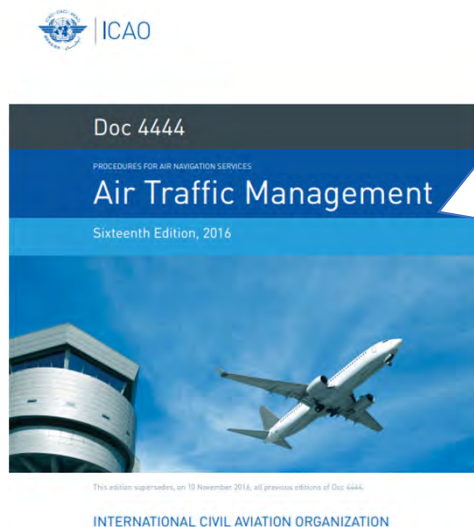
Flight plan submission/distribution -FPL



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)



Doc 4444

PROCEDURES FOR AIR NAVIGATION SERVICES

Air Traffic Management

Sixteenth Edition, 2016



This edition supersedes, on 10 November 2016, all previous editions of Doc 4444.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

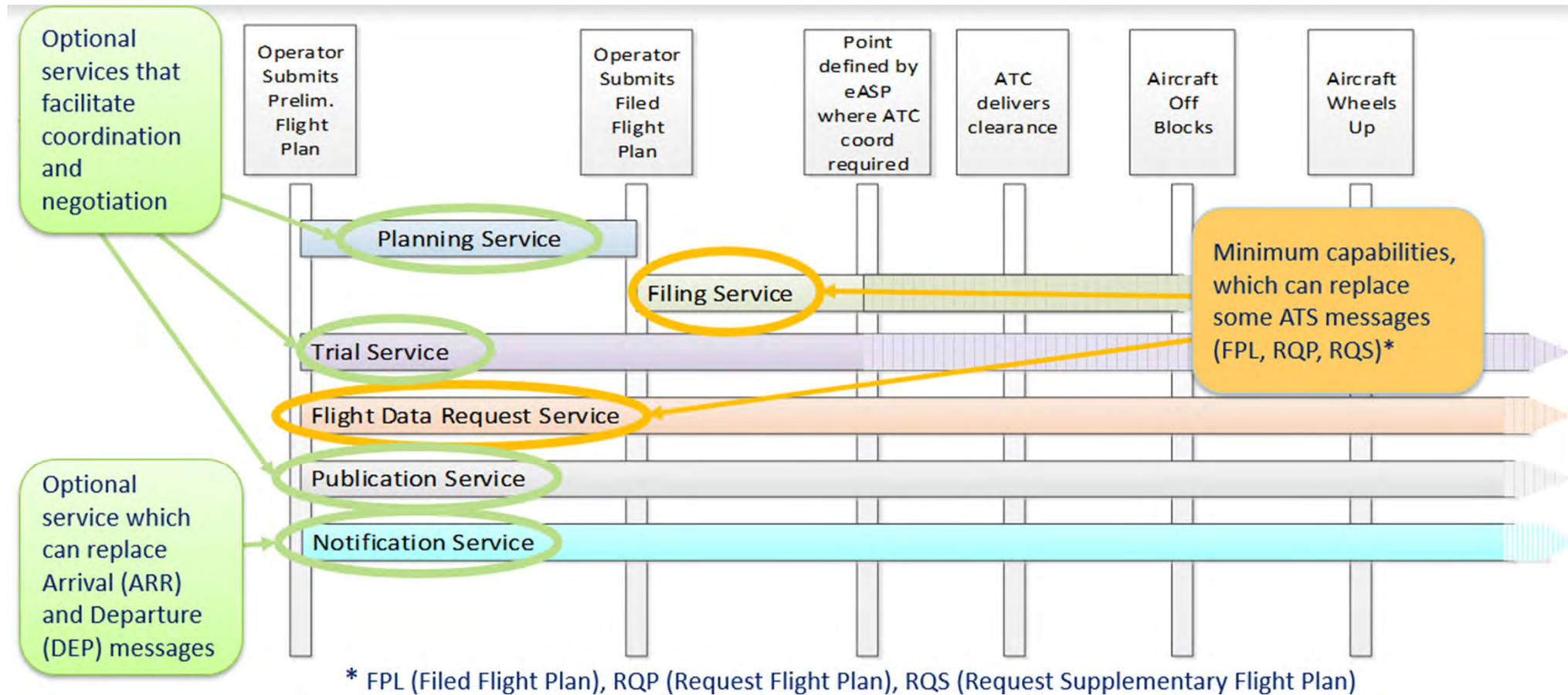
17.1.1 The FF-ICE services may include any of the following:

- 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
- 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

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**).*

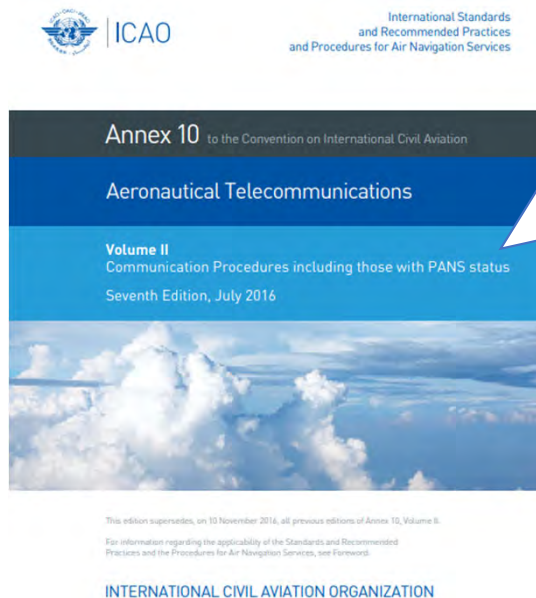
Technical and Interoperability Requirement (2/3)



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

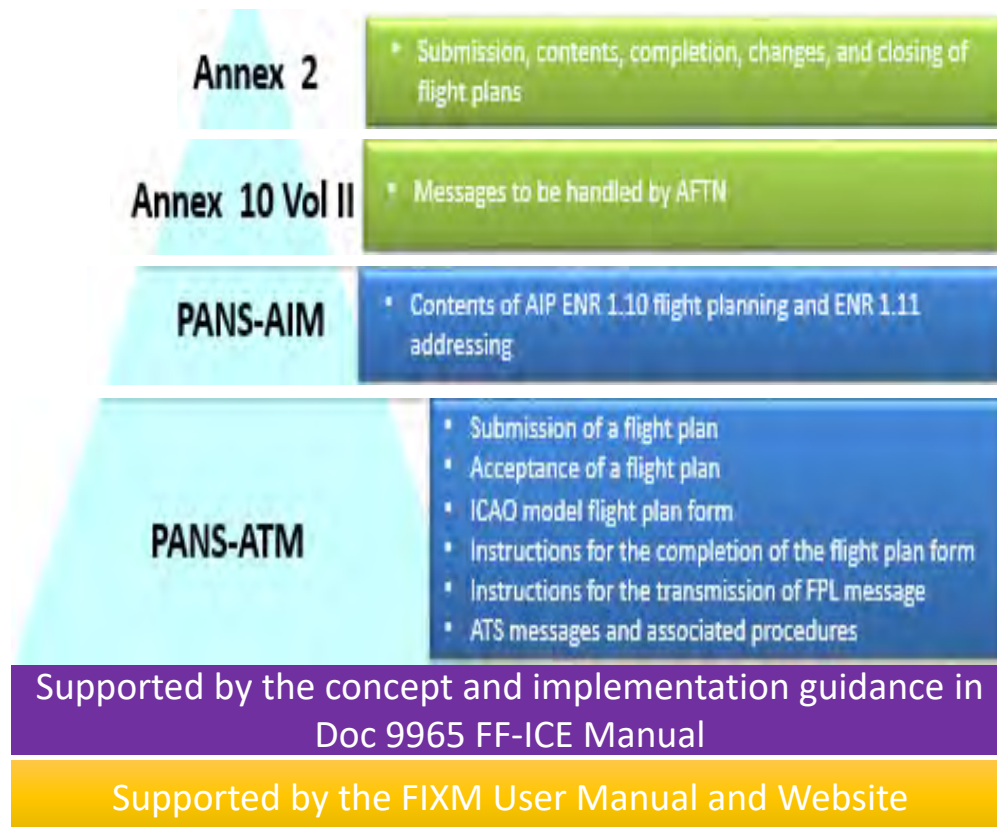
3.9.1 The originator of a preliminary flight plan (PFP) or eFPL **shall assign a single GUF**I to a flight for which the flight plan is to be submitted.

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.

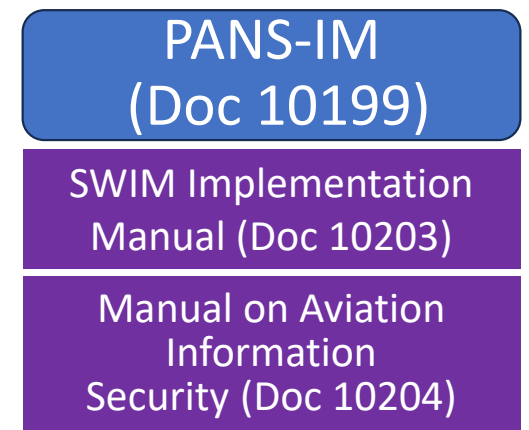
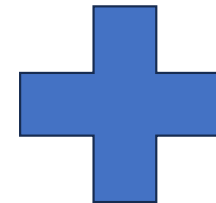
.....

Summary of Global Provisions and Guidance

FF-ICE Services



SWIM Information Service





ICAO

الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY



ATM SG/11 & CNS SG/14

19-23 Oct. 2025 **MEETINGS** Abu Dhabi, UAE

THANK YOU

