



ICAO

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WORKING PAPER

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Second Meeting of Rapporteurs of the North American, Central American and Caribbean Working Group (NACC/WG/RAP/02)

ICAO NACC Regional Office, Mexico City, Mexico, 28 to 31 March 2023

Agenda Item 5: Update of the Action Plans of the Task Groups of the NACC/WG, of the NACC/WG Action Plan and of the regional activities in the Development of the Projects of the CAR/SAM Regional Planning and Implementation Group (GREPECAS)

Flight and flow — information for a collaborative environment (FF-ICE) services

(Presented by AIDC Rapporteur)

EXECUTIVE SUMMARY	
Flight and flow – information for a collaborative environment (FF-ICE) represents the next step in flight information management, gradually substituting current flight plan information and procedures. This working paper presents a brief description of the services upon which FF-ICE is supported.	
Action:	Suggested actions are presented in section 4
Strategic Objectives:	<ul style="list-style-type: none">• Strategic Objective 1 – Safety• Strategic Objective 2 – Air Navigation Capacity and Efficiency
References:	<ul style="list-style-type: none">• Trajectory Based Operations (TBO) Global Concept• Documento 9965 - Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE)

1. Introduction

1.1 Flight and flow – information for a collaborative environment (FF-ICE) represents the next step in flight information management, gradually substituting current flight plan information and procedures.

1.2 FF-ICE is an important functionality for the achievement of Trajectory Based Operations (TBO), which in turn represents the “operational realization” of the Global ATM Operational Concept (GATMOC). It basically consists of the collaboration of all stakeholders to shared flight information during all phases of flight, beginning as early as possible, and maintaining the information consistent for all stakeholders throughout the lifecycle of the flight.

1.3 FF-ICE is realized through the implementation of several services, the details of which are to be explained in the remainder of this working paper.

2. FF-ICE concepts

2.1 To better understand FF-ICE, there are several concepts worth defining:

- a) eFPL: The symbol used to designate a filed flight plan exchanged using FF-ICE services.
- b) 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.
- c) Globally Unique Flight Identifier (GUFI): An unchangeable data element associated with a flight that allows all eligible members of the ATM community to unambiguously refer to information pertaining to the flight.
- d) Preliminary flight plan: The flight plan submitted by an operator or a designated representative to conduct collaborative planning of a flight, prior to filing a flight plan.

3 . FF-ICE General logic

3.1 The general logic of a flight's information lifecycle would be roughly as follows:

- a) A preliminary flight plan is issued by the operator or designated representative to the FF-ICE planning service units, and stakeholders in general considered necessary, so that any restrictions, constraints, or modifications of the intended trajectory can be identified. This preliminary flight plan is not necessarily sent to any air traffic service, as it is only for planning. At this time, a GUFI is assigned to the flight.
- b) Once planning has been done, the flight plan is filed (an FPL or eFPL message is sent) to the appropriate filing service unit, namely the ATS unit or other unit expressly designated by the ATS authority. This flight plan is also validated and any other constraints identified and communicated.
- c) During the different phases of the flight, any type of data regarding the flight can be requested by authorized parties, events pertaining to the flight can be notified to interested parties, and flight information made public for access by authorized parties. Modifications to preliminary or filed flight plans can be done during agreed timeframes, and any change to the flight plan information is communicated to the interested stakeholders, using version control to assure that each stakeholder has the latest information.

3.2 This is a very summarized view of FF-ICE, as there are many scenarios possible, detailed in Document 9965 (Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE)). The intention is to give a general view of how FF-ICE works.

4 . FF-ICE services

4.1 All of the functionality of FF-ICE is achieved through six defined services:

- 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. This trial request is only for informational purposes of the originator, as a “what if” exercise prior to preliminary or filed flight plan submission.
- d) **Flight data request service:** the provision of data regarding a specific flight such as the latest version of 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.
- f) **Publication service:** the publication of flight and flow data for access by authorized subscribers.

4.2 Services will be offered by FF-ICE services units, designated by the ATS authority (which could be an existing ATS unit, or a completely new one), which should be able to work with both FF-ICE and traditional messages, to allow a mixed mode environment.

4.3 ATS authorities will publish the available services in the AIP, along with the procedures to use them. At a minimum, planning and filing services should be offered, the rest are optional and would be implemented as considered feasible.

4.4 Each service has a defined set of messages that can be produced as output:

- a) Submission Response message: A response message indicating whether a submitted FF-ICE message is valid or not. In case of rejection, it also indicates reason. It would satisfy the requirement of the REJ/ACK/LAM messages, and directed at syntactic validity
- b) Planning Status message: A response to a validated PFP message indicating the flight plan acceptability and, where practicable, applicable restrictions and constraints. This message would be the REJ/ACK considering the operational and semantic validity of the flight plan, not the syntactic validity.
- c) Filing Status message: A response to a validated eFPL message indicating the flight plan acceptability.
- d) Trial Response message: A response to a validated Trial Request message indicating the expected flight plan acceptability and, where practicable, applicable restrictions and constraints.
- e) Flight Data Response message: A response to a validated Flight Data Request message, which includes the requested data.
- f) Flight Departure and Flight Arrival: These are the FF-ICE equivalents of the DEP and ARR messages, used for the notification service.

4.5 The relation between the different messages and the services that use them are depicted in APPENDIX A. FF-ICE publication service is still under development, thus it is not included.

5 . Conclusion

5.1 FF-ICE will represent a new dimension of how flight plan information is generated and handled, allowing all impacted parties to work together towards a common goal, which is that aircraft fly the trajectories as close as possible to that considered optimal, in terms of efficiency, safety, environmental impact, and any other factor that is made part of the initial evaluation. Several ICAO documents are being amended in order to accommodate the concepts and procedures that will make FF-ICE possible. Planning for FF-ICE, thus, has already begun.

6 . Suggested action

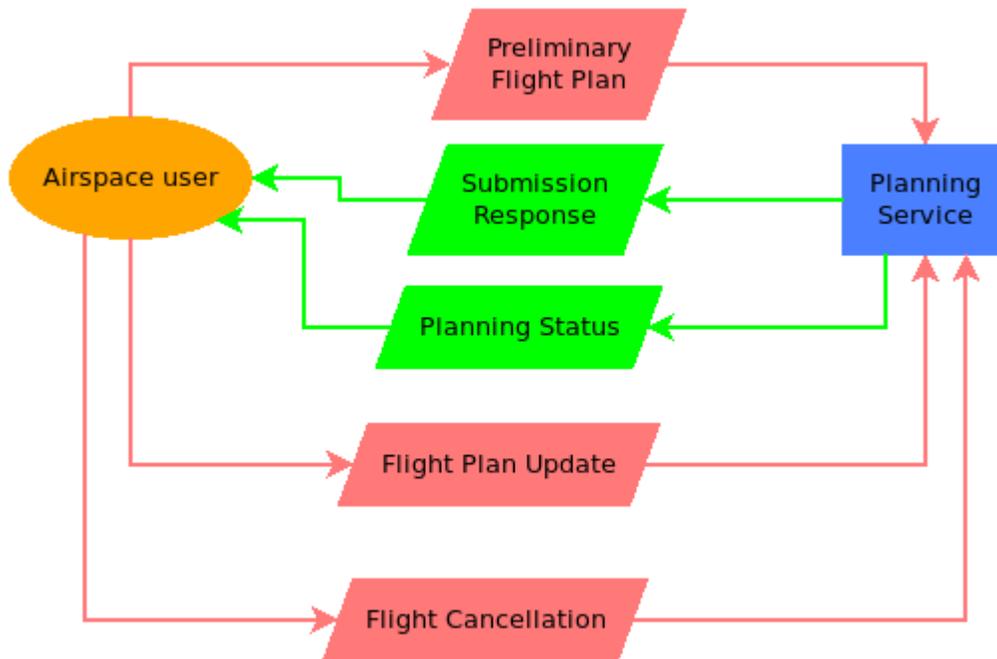
6.1 The meeting is invited to:

- a) Consider and comment the information presented in this working paper;
- b) Take part in the evaluation of the amendments to ICAO documentation regarding FF-ICE;
- c) Make provisions of future implementation of FF-ICE in the regional and national plans; and
- d) Recommend any other action as deemed necessary.

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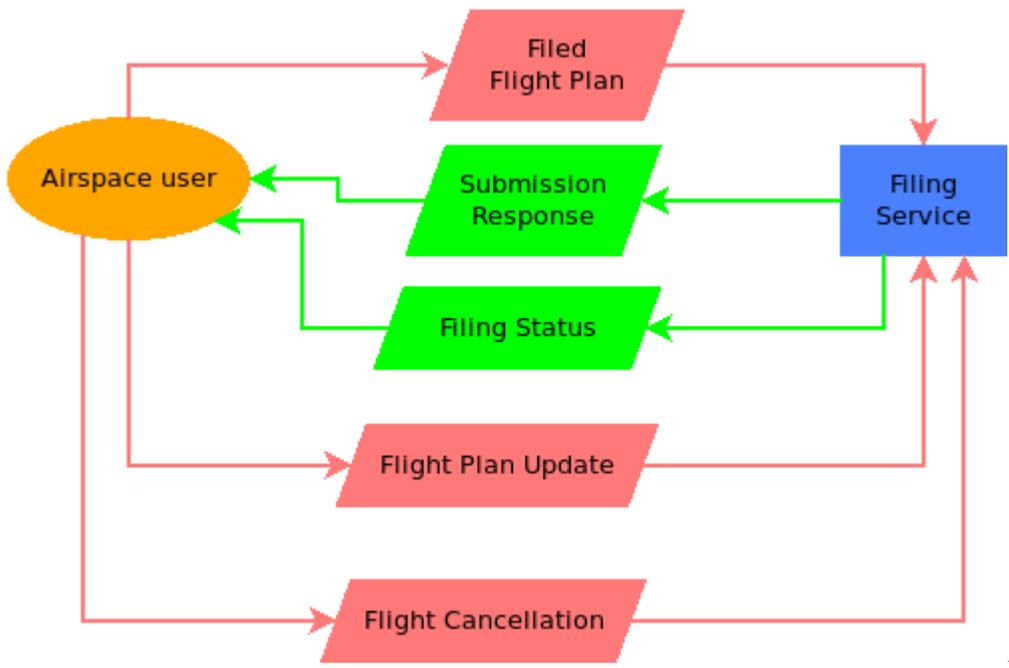
APPENDIX A

FF-ICE Services and Related Messages



planning service and related messages

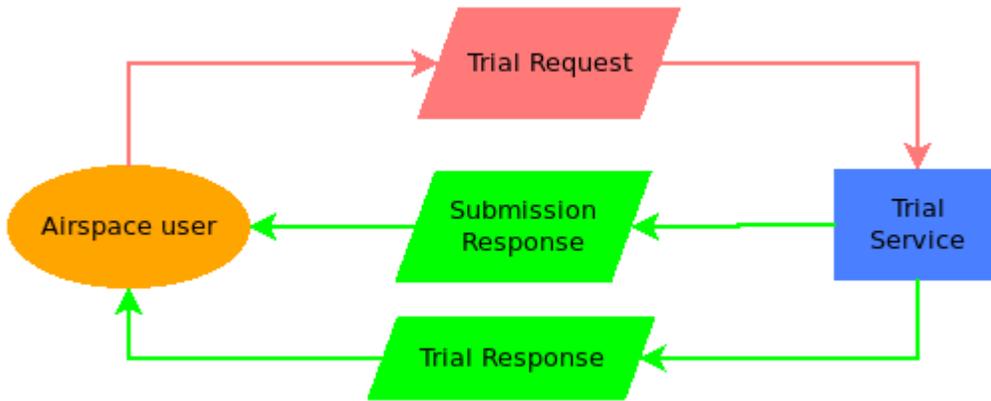
Figure 1: FF-ICE



service and related messages

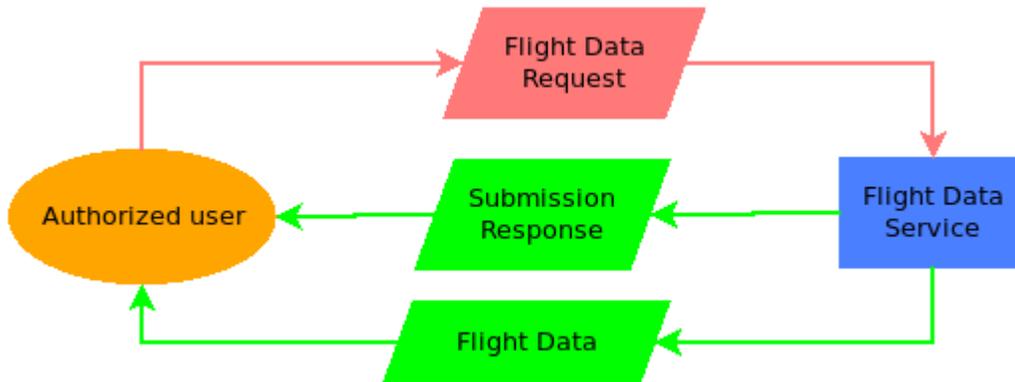
Figure 2: FF-ICE filing

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service and related messages

Figure 3: FF-ICE trial



flight data service and related messages

Figure 4: FF-ICE



notification service and related messages

Figure 5: FF-ICE

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