

Considerations for the Global Deployment of FF-ICE

Presented by TOC

Summary

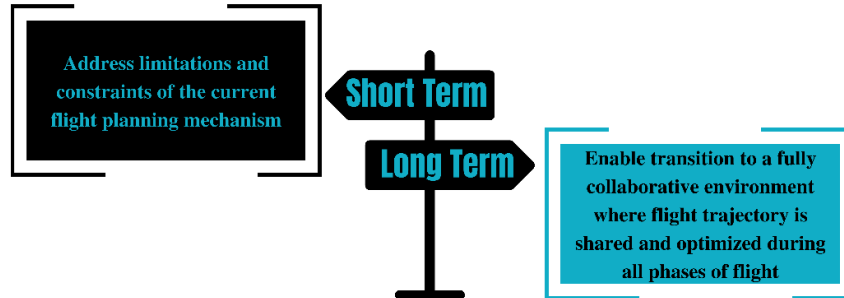
This paper is covering the ATC/ATCO part of challenges during the transition phase / mixed mode phase into the FF-ICE era.

*General information about FF-ICE is available as
WP 2015/86 "Flight and Flow – Information for a Collaborative Environment (FF-ICE)"*

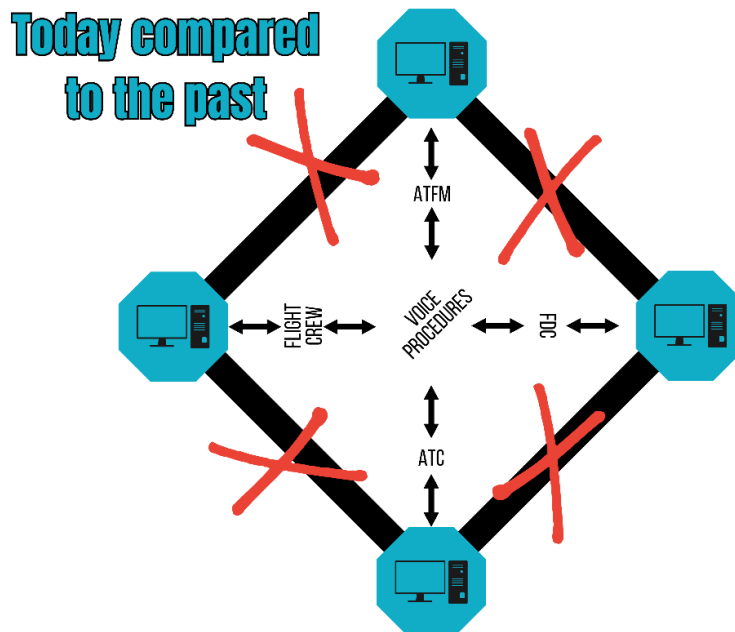
1. Introduction

- 1.1. The new flight plan format concept **F**light and **F**low Information for a **C**ollaborative Environment (FF-ICE) will enable the aviation industry to have a continuous collaboration between all relevant stakeholders managing a flight. This will help ensure the most optimized flight trajectory is provided, to ensure the safety and efficiency of flight management.
- 1.2. As the current flight plan system has been around for the past 10 years, it does not cater for the emerging needs of airport and airline operators, Air Traffic Control Officers (ATCO) and other relevant parties in the ATM domain. Additional information can only be added in the remarks field. Because of this, information cannot be automatically processed and has to be manually interpreted. This also creates an opportunity for information to be missed or overlooked like step climb planning or planned speed information.

Why FF-ICE?



- 1.3. The current flight plan system, FPL2012, can only present the ATCO with the initial intent of a specific flight without any recent changes or modification done by the departure airport, ground handling, the crew, Air Navigation Service Providers (ANSPs) or Air Traffic flow control (ATFM) units. The current system also does not update relevant stakeholders nor take into account their business intentions and decisions such as: airport authorities or the ground handling of departing/arriving airport, etc. This prevents them from being updated on the actual planning and current operational state of flight. It requires workarounds and additional systems, either local or regional, to keep such stakeholders updated. FF-ICE is designed to manage this problem.



1.4. The expression “flight plan” conveys different meanings with FF-ICE, as there will be several types of flight plans in use with the new system:

- Preliminary flight plan “PFP” (this flight plan can be submitted prior filing an ATC flight plan or a collaborative flight planning for all stakeholders. Not necessarily provided to an ATS unit)
*Note: PFP is non-committal
- Filed flight plan “eFPL” (the last flight plan submitted for the use by ATS units)
- Current flight plan “FPL” (flight plan that reflects changes to the filed flight plan by ATC clearances.

1.5. Flight plans are provided in general to all stakeholders for collaborative information sharing. The idea behind is that everyone concerned should possess the most recent information affecting the operation of the specific flight or providing time-updates.

2. Discussion

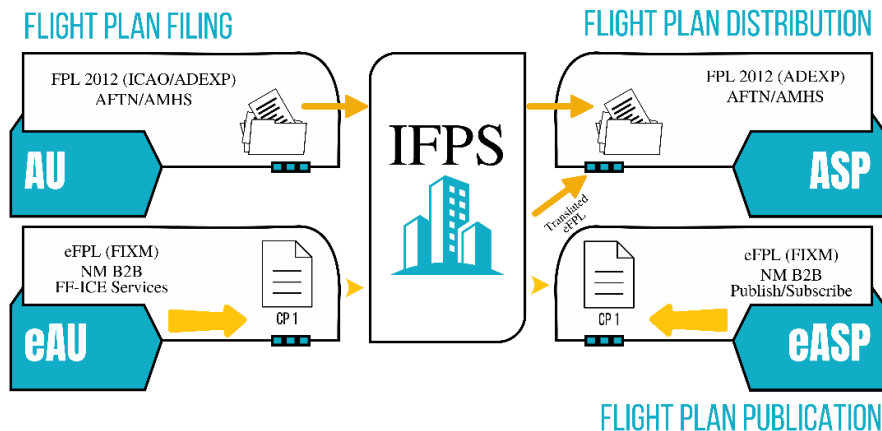
2.1. A short description of FF-ICE in general and how it is supposed to work:

FF-ICE processes several facets of the flight plan including new trajectories (flight paths, flight levels, and time constraints), time updates (such as delays), and other data. This information is then used by the system and integrated through flight data processing.

2.2. The result of this process should support the ATCO with advanced informed intentions of the flight, allowing for a better service provision to the flight, without distracting the ATCO with a mass of new information on the screen or on the label.



2.2.1. As FF-ICE enables that recent information about e.g. the flight progress is shared with all stakeholders like ANSPs, airports, operators there is the potential that a big amount of data is produced and available about each flight. Only because all this data is available doesn't mean that all these information should be provided to the ATCO.

2.3. The information (flight plans etc.) in general is collected and distributed by a dedicated FF-ICE system.



More detailed information about the functionality of FF-ICE is available in WP 86 “Flight and Flow – Information for a Collaborative Environment (FF-ICE)” (IFATCA, Sofia, 2015)

- 2.4. To gain the best outcome, a globally harmonised approach would be the best way to handle the huge changes.
 - 2.4.1. Looking back to previous huge changes, like the implementation of flight plan 2012, it is obvious that the extensive changes with FF-ICE can not be accomplished as the change to the current system within 2015. On the same day (Nov. 15th) the global air traffic system changed to the new ICAO flight plan format at the same time.
 - 2.4.2. However, we can already see that there are different requirements and developments observed in various regions to cater their individual needs for the implementation of FF-ICE as this new format has extensive and deep implications in each ATM system.
 - 2.4.3. For example, in European airspace the use of FF-ICE flight plans mandatory by the end of 2025. Whereas in some other areas of the world this date is not yet fixed and might vary years from that as the level of cooperation between ANSPs is different in other regions and this is the base for the setup of a regional implementation date.
 - 2.4.4. At the same time the sunset-date for the global end of the current FP2012 system is not yet fixed as well.

ICAO vs Europe	
<div style="text-align: center;">  <h2 style="margin: 0;">Recommendations</h2> </div> <div style="background-color: yellow; text-align: center; padding: 2px; margin: 5px 0;">FF-ICE RELEASE 1 IN ICAO</div> <p>FF-ICE R1 SERVICES:</p> <ul style="list-style-type: none"> • PLANNING SERVICE (OPTIONAL) • TRIAL SERVICE (OPTIONAL) • DATA PUBLICATION SERVICE (OPTIONAL) • FILING SERVICE (MANDATORY) • FLIGHT DATA REQUEST SERVICE (MANDATORY) • NOTIFICATION SERVICE (OPTIONAL) 	<div style="text-align: center;">  <h2 style="margin: 0;">Mandatory</h2> </div> <div style="background-color: yellow; text-align: center; padding: 2px; margin: 5px 0;">FF-ICE RELEASE 1 IN EUROPE</div> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> TRIAL SERVICE <input checked="" type="checkbox"/> NOTIFICATION SERVICE <input checked="" type="checkbox"/> PUBLICATION SERVICE <input checked="" type="checkbox"/> FLIGHT DATA REQUEST SERVICE

2.4.5. Example / Definition:

ATM is one aspect of the business of aircraft operations. However, it might be one of the core aspects of the “system aviation”.

2.4.6. We need to distinguish between simple needs for more information and integration of his new technology into existing and running system.

2.4.7. For example: If a baggage / ground crew of a handling agent has to be ready to welcome incoming aircraft for servicing this flight, the pure display of the updated ETA (estimated time of arrival) is sufficient and a maybe great new feature for them. Where this data comes from and if it was calculated by a new, more sophisticated system is not important at all.

2.4.8. However, if we are talking about using the system within the domain of ATC this new flight plan system has to be integrated into a running ATM software where the change of the whole flight data input is a severe change to the way data gets into the system and is processed by that system and the ATCO.

2.5. Dissimilar timelines are being developed for different regions, at least this is a step where the late adopters can learn from regions with earlier implementation dates. However, what this means for a possible sunset date for FPL2012 is still very unclear and is depending on the success during the global implementation. This could create an environment with different flight plans in use for years in adjacent units.

2.5.1. Until the full implementation of FF-ICE happens, there is still the question: How will mixed flight plans (current flight plan format and FF-ICE format) affect our working environment?

2.5.2. First, we have an example of the possible changes an ATCO will face with FF-ICE: Beside the fact that there might be a display of additional information like TOC (top of climb), TOD (Top of descent), or other speed/level-groups to display the 4D trajectory, this must be supported by the system, which is not the case with many ATM systems presently.

2.5.3. This means: Having some more data available somewhere deep in the system and using this data to improve ATC service are two different things!

2.5.4. The fact that an ATC unit is receiving more detailed and more accurate as well as more recent data of a flight does not mean operators can expect an increase of service delivery (e.g. reduction of delays) for their aircraft from the very beginning from all ATC Units.

IFATCA policy is:

WC 10.2.5 AUTOMATION / HUMAN FACTORS (TPM – Version July 2023)

...
The number of items displayed on one label and the number of items/information displayed on the current screen should be set after a dedicated study.
...

2.5.5. As well in working paper “Information overload in ATC” (WP158 / 2023) IFATCA discussed this issue, and you can read further elaboration about this there.

2.5.6. In Europe FF-ICE plans are used already by some airlines, however it is not known if ATM-systems are able to process these plans already as the translation service of the Eurocontrol Network Manager is being used to transfer the FF-ICE flight plans into the current FP2012 format.

2.5.7. Therefore, Eurocontrol is offering an official translator: FF-ICE flight plans are being translated into regular flight plan formats as very few ATM systems currently are already able to understand and process the new FF-ICE plans.

2.5.8. For example, additional trajectory information could be lost as TOD/TOC information is only translated in speed/level groups, as more sophisticated tools (e.g. dynamic route amendments etc.) are not available in FP2012.

2.6. There are additional IFATCA policies which pertain to Flight Planning and the ATM System including ATS 3.38:

ATS 3.38 FLIGHT PLANNING ACCURACY AND IMPACTS ON THE ATM SYSTEM

IFATCA policy is:

Electronic filing and automated conformance checking of flight plans are preferred.

Air traffic controllers shall be able to issue any clearance to an aircraft based on the capabilities in its flight plan. Automation should be in place to detect if, according to flight plan information, an aircraft is unable to execute any procedure in use.

Flight plan submission and correction by controllers, while responsible for separation of aircraft should be minimized.

- 2.6.1. For safety reasons ATCOs shall concentrate on the monitoring and coordination of actual traffic and distraction by the obligation to work on several systems at the very same time is considered to be a safety hazard.
- 2.7. There are known challenges for the ATCO during the implementation phase and consequences for ATCOs during this “Mixed Mode Operations” which is covered in the TPM within ATS 3.12.

IFATCA Policy is:

ATS 3.12. MIXED MODE OPERATIONS

Efforts should be undertaken to reduce existing Mixed Mode Operations by creating intrinsically safe solutions.

Introductions of new Mixed Mode Operations should be avoided by creating intrinsically safe solutions.

- 2.7.1. Therefore, IFATCA is opposed to all ideas of working with more than one flight plan format at the very same time. As well the ATCO shall not be responsible for modifications of flight plans in different formats while controlling aircraft.
- 2.8. The implementation of FF-ICE will be going on a regional level and in phases which depend on the readiness of all stakeholders (AUs, ANSPs, etc.). Most possibly translator services will be used globally to transform the first FF-ICE plans into the current FP2012 system to make it work within the ATM system. This means that some of the new features will not be used as these (e.g. trajectory data) can not be translated and therefore cannot be used in the current system.
- 2.8.1. To reduce the risk of data confusion and missing data due to false, falsely translated or just simply not completely filled out flight plans there it will be beneficial for the ATCO to be supplied with a single format of flight plans - either the old or the new one.
- 2.8.2. It is undesirable for ATCOs to deal with several systems as they are there to provide their service for safety of all aircraft by the use of ONE working ATM system and not mixing several systems together or switching working positions or displays during the work to facilitate several systems responsible for the same target (like flight plan data, flight plans) at the same time.

3. CONCLUSIONS

- 3.1 FF-ICE will be implemented globally, however, due to different priorities and the impact of COVID there have been delays in the development and research of the project. This has caused different timelines in the various regions. Some regions will be working with FF-ICE as early as 2026, others have not even agreed on a timeframe for implementation.
- 3.2 Despite the possible different development / implementation status of the system in neighbouring units, ATCOs should not work with more than one FP interface at a time to ensure operational safety.
- 3.3. The translation of different flight plan formats should take place in the background.

4. Recommendation

It is recommended that the following policy is added to existing IFATCA Policy ATS 3.38 regarding Flight Planning Accuracy and Impacts on the ATM System:

- 4.1 ATCOs shall be presented with flight plans in a single flight plan format.
- 4.2 ATCOs shall not be responsible to maintain multiple versions/formats of the same flight plan.
- 4.3 ATCOs shall not be responsible to translate flight plans into alternative flight plan formats.

And is added to the Technical and Professional Manual.

5. References

- 5.1 Flight plan and flight data evolution (FPFDE). Eurocontrol
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- 5.2 Implementation Strategy for FPFDE NFPM, Eurocontrol
<https://www.eurocontrol.int/publication/implementation-strategy-fpfde-nfpm>
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<https://www.aircraftit.com/articles/the-foundation-for-collaborative-atm-and-tbo/>
- 5.4 Flight & Flow Information for a Collaborative Environment (FF-ICE)
"A Concept to Support Future ATM Operations", ICAO
<https://www.icao.int/airnavigation/ffice/Pages/default.aspx>
- 5.5 The Role of FF-ICE, ICAO
<https://www.icao.int/airnavigation/FFICE/Pages/Role-Of-FFICE.aspx>

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