Content

- Strategic perspective
- FF-ICE
- State of play
Drivers For Change

- **ICAO GLOBAL ATM OPERATIONAL CONCEPT (Doc 9854)**
  Envisages an integrated and collaborative ATM system which employs the benefits of Trajectory Based Operations and CDM, enabled in a SWIM environment

- **ICAO AVIATION SYSTEM BLOCK UPGRADE (ASBU) PROGRAMME**
  A planning framework for global harmonisation & interoperability

- **SESAR ATM MASTERPLAN & Pilot Common Project**
  Requirement to exchange 4DT from 2022
TBO Building Blocks

- FF-ICE
- SWIM
- ADS-C EPP
- Sharing & coordination processes with all parties involved (airlines, CFSP, ANSP, aircraft, etc.)
Current Limitations

- Limited collaborative planning amongst ATM, aerodrome operators & aircraft operators
- Less than optimum use of scarce resources such as airspace
- Limited facilities for real time information exchange amongst ATM actors resulting in less than optimal response to real time events & changes in operational requirements
- Limited ability to maximise the benefits of advanced avionics

Resulting In:

INEFFICIENT AIRCRAFT OPERATIONS
Aims

- Ensure that definitions of flight & flow information are machine readable and globally standardised
- Incorporate information for increased CDM from the planning phase until the end of the operation
- Facilitate 4-D Trajectory Based Operations
- Allow operators to detail their performance capabilities
- Allow for an early indication of flight intent
- Avoid unnecessary limitations on information availability
- Allow for the provision of security requirements
- Consider the cost impact on providers and consumers of flight & flow information
Benefits To Be Delivered

- Capacity - Reduced controller workload and increased data fidelity supporting improved capacity
- Efficiency – better knowledge of aircraft capabilities, operator preferences & ATM constraints facilitates efficiency improvements
- Flexibility – greater accuracy facilitates flexibility, quicker adaptation of route changes
- Global Interoperability – A new mechanism for FPL filing and information sharing will facilitate flight data sharing amongst all actors
- FF-ICE/1 will facilitate CDM, the implementation of systems interconnection for information sharing & trajectory negotiation before departure thus improving capacity & efficiency
- Safety – more accurate flight information & dynamic management of TBO
- FF-ICE
FF-ICE

- Three phases
  - FF-ICE/1 – pre-departure enables the sharing and negotiation* of the planned trajectory between AU and ATM
    - Negotiation = systematic exchange of feedback
  - FF-ICE/2 – extend capability into post-departure phase
  - FF-ICE/3 – aircraft in the loop – TBO clearances
FF-ICE/1

- FF-ICE includes:
  - ICAO Provisions : ATMRPP
  - Flight Information eXchange Model (FIXM) : Industry partnership
  - Applicability Date 2020

- Scope FF-ICE/1 (information):
  - FPL 2012
  - ASBU Block 1 flight information needs → pre-departure
  - GUFI (Global Unique Flight Identifier)
  - Submission and Maintenance process
  - 4D Trajectory elements inc. flight performance
  - Fleet prioritisation, Airport Slot, Dangerous Goods
  - Capabilities e.g. A-RNP
  - “Planning” phase – route/4DT negotiation

IATA HQ
Active involvement
FF-ICE Flight Planning Services

An exchange of flight planning related information within a SWIM environment

- **Planning Service (Optional)**
  - Preliminary Flight Plan Message
  - Flight Plan Update Message
  - Flight Plan Cancellation Message
  - Submission Response Message
  - Planning Status Message

- **Trial Service (Optional)**
  - Trial Request Message
  - Submission Response Message
  - Trial Status Message

- **Publication Service (Optional)**

- **Filing Service (Mandatory)**
  - Filed Flight Plan Message
  - Flight Plan Update Message
  - Flight Plan Cancellation Message
  - Flight Departure Message
  - Flight Arrival Message
  - Submission Response Message
  - Filing Status Message

- **Flight Information Service (Mandatory)**
  - Request Flight Plan Information Message
  - Flight Plan Information Response Message
FF-ICE/1 Content - Submission / Distribution procedures

- State responsible for Dept. to publish applicable procedure(s):
  - AU to submit via ASP
  - AU to submit directly to concerned parties (ANSPs, etc.)

- If State responsible for Dept. fails to publish a procedure for FF-ICE submission:
  - AU may submit directly to concerned parties (ANSPs, Airports, etc.
  - AU may submit via an eASP having published its willingness to perform the tasks for the flight concerned

- If none of the above apply, the AU shall submit an FPL in accordance with current provisions
FF-ICE/1 Content - Filing Service - Filed Flight Plan (eFPL)

- Analogous process to today
- Contains all required information
- Information used for provision of ATS services
- Distribution to all concerned in appropriate format & via appropriate network(s)
- Feedback
  - Submission Response (ACK, MAN, REJ)
    - Synchronous response
    - Error indication as appropriate
- Filing Status
  - May be asynchronous
  - Route / 4DT feedback (Acceptable, Not Acceptable)
  - Error indication as appropriate
An optional service – recommended to be provided by eASPs with many constraints and/or providing an ATFM service

May contain limited information – intent to fly

‘Preliminary Flight Plan’ used for planning purposes only

Performed only with eASP, as determined/required by AU

Feedback

Submission Response (ACK, MAN, REJ) - almost never rejected
  - Synchronous response
  - Error indication as appropriate - error plus cause (reference to constraint)

Planning Status

May be asynchronous

Route / 4DT feedback (Concur, Negotiate, Non-Concur)

Error indication as appropriate - error plus cause (reference to constraint)

Route / 4DT proposal (optional)
Improvement Cycle

- **Plan** – “An organised (and usually detailed) proposal according to which something is to be done”
  - Requires collaboration

- **Predictability** is achieved through the creation, maintenance and adherence to a plan
  - Requires collaboration

- **Flexibility** – “capacity for ready adaptation to various purposes or conditions”
  - Requires collaboration
Improvement Cycle [2]

Planning
- Schedule / Historic Data
- Early Intent & Collaborative Planning (Preliminary FP)
- eFPL (4DT)
- AOP Integration: A-CDM
- Short term feedback: SID/STAR/PTRs/EPP

Flexibility
- AU Priorities UDPP, Fleet Prioritisation
- AU operational needs
- Unforeseen events, disruption handling

Predictability
- Capacity, Occupancy Counts
- CPRs, 4DT sharing / publication, EPP
FF-ICE/1 Content - Trial Service (‘Trial Request’)

- An optional service – recommended to be provided by eASPs with many constraints and/or providing an ATFM service
- Can only be used when a Preliminary or Filed flight plan already exists
- Not retained or used by ATM
- Feedback
  - Submission Response (ACK, MAN, REJ)
    - Synchronous response
    - Error indication as appropriate - error plus cause (reference to constraint)
  - (Trial) Planning Status
    - May be asynchronous
    - Route / 4DT feedback (Concur, Negotiate, Non-Concur)
    - Error indication as appropriate - error plus cause (reference to constraint)
    - Route / 4DT proposal (optional)
TBO Prerequisites

- Higher granularity / fidelity → discrepancies are immediately obvious - no hiding place

- Consistent AIM/ATM data
  - Airports, ATS routes, Airspaces, etc.
  - Constraints – static, dynamic, ATFM measures

- Met data
  - Same Met data / knowledge of Met data applied
Trajectory Prediction - Today

Operator

Business parameters, Flight parameters, Fuel costs, ATM procedures & constraints

ATM

De-fault flight parameter ATM procedures & constraints

* No collaboration

- ADEP 0945
-N0440F330 A1 ABC UA1 XYZ UL123

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**Trajectory Prediction - Tomorrow**

**Operator**
Business parameters, Flight parameters, Fuel costs, ATM procedures & constraints

**ATM**
De-fault flight parameters, ATM procedures & constraints

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Collaborative process

- ADEP 0945
- N0440F330 A1 ABC UA1 XYZ UL123

ETA=1112
State of Play
Provisions Development

Focused on transition:

- Annexes
  - Annex 2 – submission procedure
  - Annex 15 – the need to publish requirements and capabilities with regard to FF-ICE

- PANS-ATM
  - Chapter 4 – inclusion of additional new format flight plan
  - New Chapter 17 ‘FF-ICE Messages’ – procedures related to FF-ICE

- Manual on FF-ICE (Doc.9965)
  - New Part – ‘Implementation Guidance’ – guidance material including material expected to be ‘elevated’ to a new PANS-ATM Appendix in due time
### Provisions Timeline

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#### Panel review and endorsement process

- **ANC Review**
- **ANC Council Approval/Adoption**
- **SG review/Approval**
- **Published and Applicable**

#### Secretariat, ANC and Council review and approval process

- **ATMRPP**
- **ANC**
- **Council**
- **Secretary General**

**Network Manager**

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Implementation Considerations

- Benefit driven - No big bang

- Mixed mode
  - Data: Enabled (FF-ICE) / Non-enabled (FPL2012) – even for the same flight plan!
  - Technology: AFTN (AMHS), SWIM (Publish & Subscribe)

- No modifications to existing FPL format
End of Presentation

Thank you for your Attention