International Civil Aviation Organization

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FF-ICE
A CONCEPT TO SUPPORT THE ATM SYSTEM OF THE FUTURE

Saulo Da Silva

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Overview

- BACKGROUND TO FF-ICE
- DRIVERS FOR CHANGE
- SUMMARY OF CONCEPT
- IMPLICATIONS
- BENEFITS

Flight plan

‘SPECIFIED **INFORMATION** PROVIDED TO AIR TRAFFIC SERVICE UNITS, RELATIVE TO AN **INTENDED FLIGHT** OR PORTION **OF A FLIGHT** OF AN AIRCRAFT’

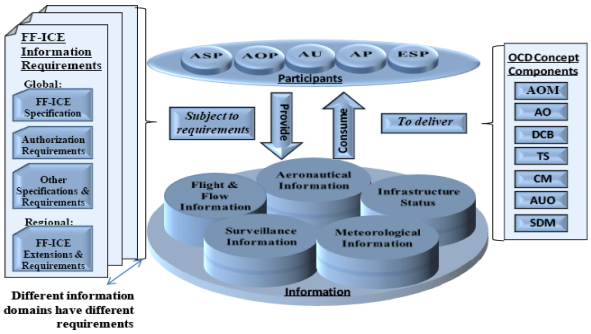
(ICAO DEFINITION)

Air Traffic Management (ATM)

‘THE **DYNAMIC**, INTEGRATED MANAGEMENT OF AIR TRAFFIC AND AIRSPACE INCLUDING AIR TRAFFIC SERVICES, AIRSPACE MANAGEMENT AND AIR TRAFFIC FLOW MANAGEMENT – SAFELY, ECONOMICALLY AND **EFFICIENTLY** – THROUGH THE PROVISION OF FACILITIES AND SEAMLESS SERVICES IN **COLLABORATION** WITH ALL PARTIES AND INVOLVING AIRBORNE AND GROUND BASED FUNCTIONS’

FF-ICE

- 2004 – ICAO Started developing future flight plan concept of '**information for a collaborative environment'.**



The need for change

- How often is the ICAO paper flight plan form actually used to file a flight plan?
- How representative of the capabilities of both airborne and ground based systems is the current form and process?

Limitations of ATM system (1)

- Disparate services & procedures
- Reliance on voice radio communications
- Rigid airspace divisions & route structures
- Limited collaborative planning amongst ANSPs, aerodrome & a/c operators
- Less than optimum use of resources

Limitations of ATM system (2)

- Limited facilities for real-time information exchange
- Limited ability to maximise benefits for aircraft with advanced avionics
- Long lead times for development and deployment of improved systems.

Consequences

- Non optimized departure & arrival procedures
- Exclusion of civil traffic from airspace reserved for special use
- Indirect fixed routes
- Excessive system related delays
- Operation of a/c at inefficient FLs, speeds & in unfavourable MET
- Insufficient flexibility to properly manage disruptions to airline operations.

ICAO requirements

- Global ATM Operational Concept (Doc 9854)
- Manual on ATM System Requirements (DOC 9882)
- Manual on Global Performance of the Air Navigation System (doc 9883).

FF-ICE concept

- Facts and data to support performance based decision making
- Data representing results of performance based decision making
- Data related to managing the performance of individual flight
- Data related to managing overall performance & meeting expectations
- Mechanisms for ensuring data consistency and interoperability
- Mechanisms for increased flexibility regarding new information.

Addressing limitations

- Sharing flight information
- Advance notification
- Inconsistent information
- Information distribution
- Information security
- Flexible information set.

Principles of FF-ICE(1)

- Flexible concept allowing new technologies & procedures to be incorporated as necessary
- Detailed indication of a/c performance capabilities
- Early indication of intent
- Information for increased & more automated CDM
- Avoidance of unnecessary limitations on information

Principles of FF-ICE (2)

- Support for 4D trajectory management
- Avoidance of filing unnecessary/ambiguous info
- Provision of info security requirements
- Consideration of cost impact
- Ensures information is machine readable
- Globally standardised definitions of information elements.

Information elements

- Flight identifying information
- Flight SAR information
- Flight permission information
- Flight preferences and constraints information
- Trajectory type
- Surface segment type
- Airborne element type
- Performance information
- Aircraft intent
- Flight trajectory information

Technical environment

- Data model
- System Wide Information Management (SWIM)
- Supporting infrastructure

Infrastructure

- Communication network
- Safety and security features
- Data exchange formats – will use XML

Example timeline for info provision

- Scheduling and strategic activities
- Pre-tactical operational planning
- Tactical operational planning
- Flight operation

Transition & implementation

- **Operator flight planning systems** - will require changes to extract and process info to facilitate the collaborative process
- **ASP and AOP systems** – modifications to implementing systems to facilitate interaction
- **Documentation & training** – changes to procedures & systems will necessitate new documentation & training.

Benefits

- ***Cost Effectiveness*** - Standard information will reduce cost of system development
- ***Efficiency*** - Better knowledge of trajectory information will allow more optimum flight profile
- ***Global Interoperability*** – Global interoperability is facilitated by easier connection of all stakeholders

Benefits

- ***Participation by the ATM community*** - Participation of all stakeholders is facilitated through real-time data sharing
- ***Predictability*** - The sharing of information between aircraft and ground systems will enhance the predictability
- ***Safety*** - System wide data sharing will allow early detection of inconsistencies and updated information which will improve situation awareness..