Weather Delivery and Display in the Cockpit

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The Concepts

INFORMATION MANAGEMENT FOR ATM

Need for timely, relevant, quality-assured information directly into the cockpit

AIS (Annex 15)

- Aeronautical Information Package (AIP, AIC, etc.)
- AIRAC system
- Permanent changes and NOTAM

MET (Annex 3)

- Various products and services (Reports, forecasts, etc.)
- Pre-flight planning / radio contact
- Dynamic and time-sensitive
The Vision

- Paper PIB *(Dated info)*
- Today’s ACARS *(DL Text-Based)*
- Future Data Link *(DL Data Depicted Graphically)*
ASHTAM
Eyjafjallajokull (e-ja-fal-la-yokel)
(a.k.a. “That Volcano in Iceland”)

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Nof : LFFA  Type : R  Identifiant : A 2345 / 10 A03

A/R : A 2344/ 10

Q) LFXX/QXXXX/IV/NBO/E/ 000/ 205/4558N-00520E 999

A) LFBB  LFEE  LFFF  LFMM  LFRR

B) 10-04-21 07:21  C) 10-04-22 04:00

D)

B) DUE TO ICELANDIC VOLCANO EYJAFJALLAJOKULL ACTIVITY, VFR PUBLIC AIR TRANSPORT FLIGHTS AND ALSO ALL IFR FLIGHTS ARE PROHIBITED WITHIN FRENCH AIRSPACE, FROM SURFACE TO FL205, LOCATED ON NORTH OF A LINE LAPEX (4700N, 00800W) / NANTES-ATLANTIQUE LFRS (4709N, 00136W) / LG (4847N, 00032E) / DPE (4956N, 00110E) EXCEPT FOR FLIGHTS CONDUCTING HUMAN SAFETY OPERATIONS. - HOWEVER, IFR DEP OR ARR FERRY AND CARGO FLIGHTS FROM OR TO AD LOCATED WITHIN THIS AREA ARE AUTHORIZED AFTER INFO FROM AIRSPACE MANAGEMENT CELL, AT THE FLW ADDRESS : AMC.FRANCE’AT’AVIATION-CIVILE.GOUV.FR
Same ASHTAM Depicted Graphically
-- Source: UK MET Office, April 2010 --
Electronic Flight Bags

Used for AIS & MET Display in Both Legacy and New Aircraft
Fundamentally…

- WTIC is meant to promote CDM between dispatch, pilot, ATM/C
  - Strategic, not tactical (where is the transition?)
  - Does not (necessarily) promote autonomous pilot responses
  - Purpose, bottom line: to reduce the uncertainty of pilot response to a weather constraint or hazard

- WTIC also facilitates verification of applicability and temporal/spatial precision of weather R&D
Shared Situational Awareness is Key

ANSP
Airport Authority

AOC

Peer-to-peer information exchange

DB
Datalink

Authoritative data source
Notional AIS & MET Ground & Air Data Link Architecture

Ground-Side Architecture

AIS / MET Authorized / Authoritative Data Source

Internet

Ground Transceiver

Airborne Avionics

Transceiver and Processor  FMC  Display

Aircraft-to-Aircraft Data Link Reports

Ground-to-Air / Air-to-Ground Link
RTCA SC206/EUROCAE WG76

• Operational Service and Environmental Description (OSED) complete
  – Essentially, a concept of operations within defined environment(s)
• Safety and Performance Requirements (SPR)—final review and comment complete
• Approved TOR moving forward
  – DO 267 revision--Update requirements for advisory data link services
  – Concept of use, scope and plan for MASPS supporting AIS and MET data link services as the normal (or primary) means for cockpit receipt
  – Potential DO-252 revision for air-to ground data link
  – SC -186 WG1 potential applications of A-G data link OSEDs
    • Wake Vortex
    • Air Traffic Management
    • Weather Applications
  – AIS and MET Services Delivery Architecture Recommendations
  – Aeronautical Information Services/Meteorological (AIS/MET) MASPS
SAE G-10 Human Factors Support

• SAE G-10 has been asked by SC-206 to address HF issues associated with data link
  – ARP 5464—Human Factors Considerations in the Design of Multi-function Display Systems for Civil Aircraft (published)
  – ARP 5621—Electronic Display of Aeronautical Information – Charts (published)
  – ARP 5740—Cockpit Display of Data Link Weather Information (in progress)
  – ARP XXXX—Temporary Aeronautical Data (TBD)
• Relevant ARPs will be referenced in MASPS
Challenges

• Authoritative data source
  – Key enabler

• Adoption and maintenance of common data formats for both aeronautical information and weather exchange models (AIXM and WXXM)

• Development and harmonization of standards and initiatives
  – ICAO and WMO
  – RTCA and EUROCAE