



CENTER FOR ADVANCED AVIATION SYSTEM DEVELOPMENT (CAASD)

Approved for Public Release; Distribution Unlimited
Case Number 07-0643

Safety and Performance Requirements (SPR) and Interoperability Requirements (INTEROP) for Aeronautical Information Services Data Link

Daniel V. Stapleton

May 2007



Background

- **RTCA¹ SC-206/EUROCAE² WG-76** is developing new standards for Aeronautical Information data link
 - **Aeronautical Information Services (AIS)**
 - **Meteorological Information Services (MET)**
- The datalink communications industry is a prime stakeholder and directly affected by the results of this effort
- **▶ Industry needs to be engaged to ensure a useful outcome** (equipment manufacturers and communications and weather services providers)

Notes:

1. RTCA, Inc. (a not-for-profit corporation) functions as a federal advisory committee
2. EUROCAE - European Organisation for Civil Aviation Equipment (aviation equipment regulatory agency)

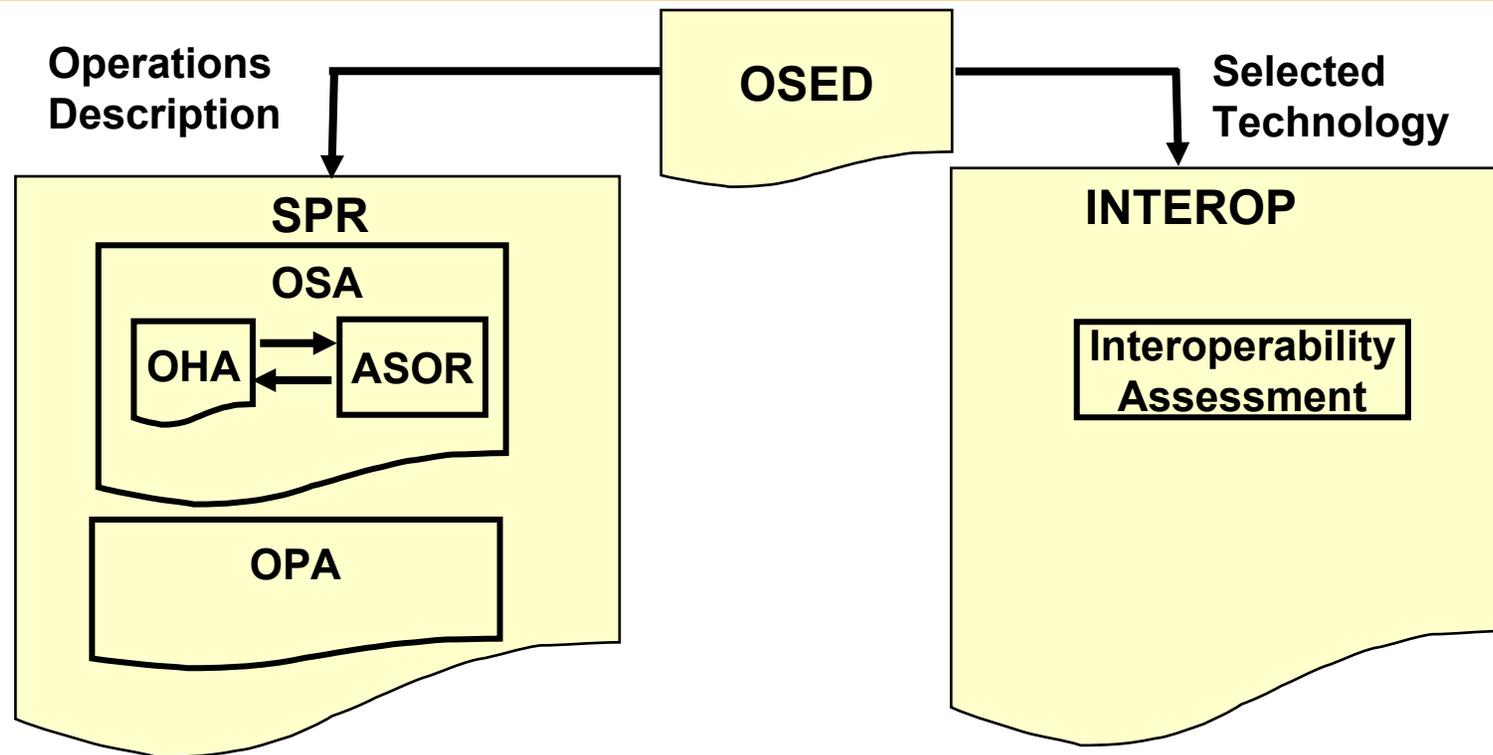


Types of Data for Aeronautical Information Services

- **Aeronautical information: Terrain, obstacles and navigation database updates, NOTAMs**
- **Meteorological information: forecasts, reports, text and graphics (Flight Information Services)**
- **Organization:**
 - **AIS: data organized by whether temporary or permanent**
 - **MET: data organized by how it is used for decisions**
 - **Immediate/Reactive – wind shear, wake turbulence**
 - **Near-term – turbulence, convective activity**
 - **Planning – weather observations, forecasts**



The Process: Understanding and Addressing the Issues



- OSED – Operational Services and Environment Definition**
- OSA – Operational Safety Assessment**
- OHA – Operational Hazard Assessment**
- ASOR – Allocation of Safety Objectives and Requirements**
- OPA – Operational Performance Assessment**



Sample Weather Issues

- **Providing new uses for weather products**
 - **Primary use vs. advisory or supplemental use**
 - **Performance (OPA): Can faster delivery times, higher level of integrity be achieved?**
 - **Safety (OSA): Can mitigations be found for risks?**
- **Examples of use that present integrity, availability, and delivery time issues**
 - **Getting Minimum Equipment List (MEL) relief, using NEXRAD to substitute for airborne weather radar**
 - **Using data link to provide “tactical” weather products (TDWR, TWIP and newer products) which can be used for “reactive” (immediate) decisions**

TDWR – Terminal Doppler Weather Radar

TWIP - Terminal Weather Information for Pilots



Sample AIS Issues

- **New process for updating onboard databases (Sync service) - performance and safety issues**
- **Certification of on board databases - safety issue**
- **Integrity and consistency of the uplink data - safety issue**
- **Availability of ground infrastructures required to filter and process the uplink data - performance issue**
- **Converting NOTAMs to allow graphical representation; updating, superseding**



Example of Hazard Analysis Combined With ASOR

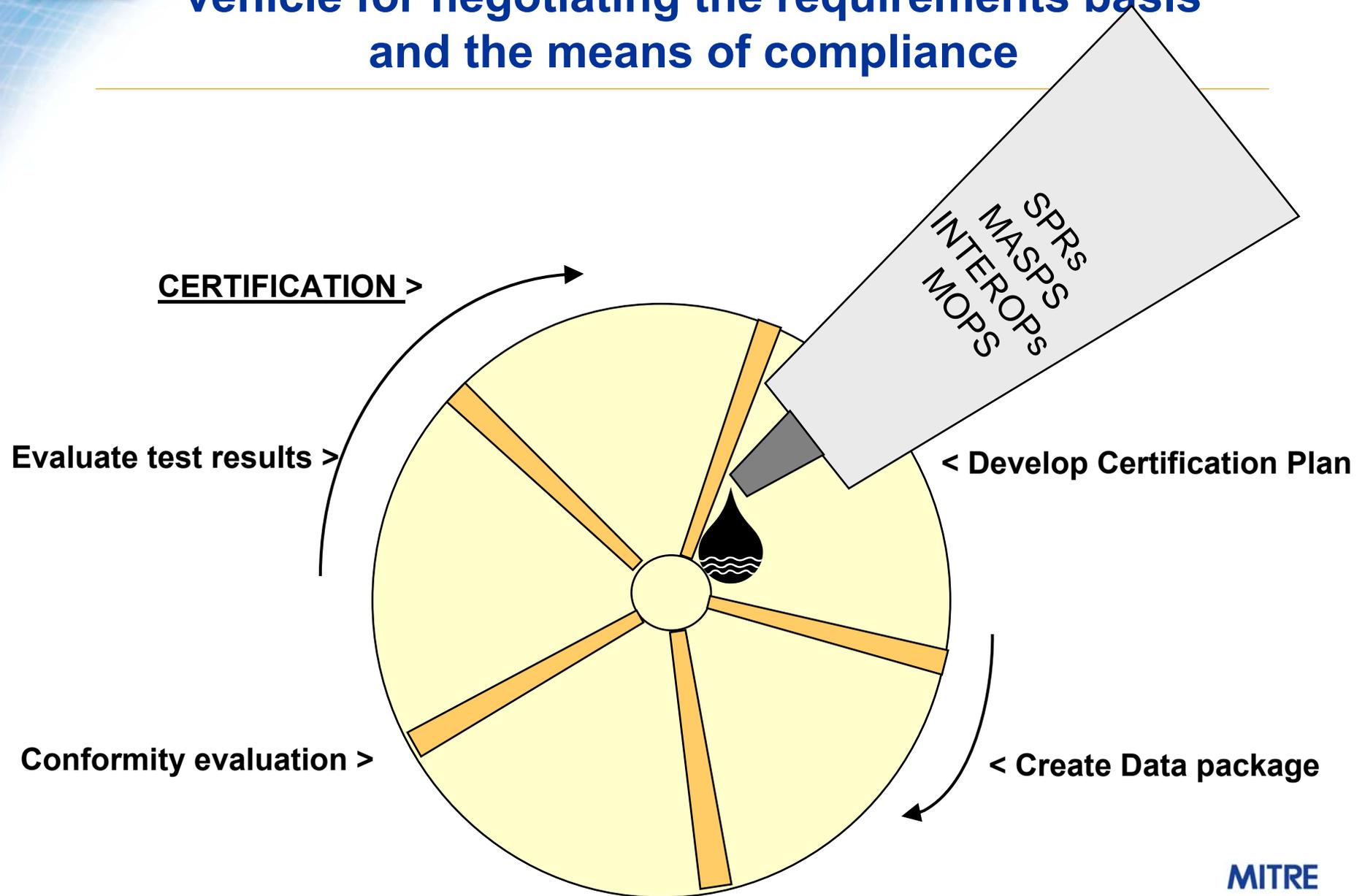
Hazard ID	Message Element Failure Mode	Failure Classification – Operational Effects ¹	Hazard Classification ²	Risk Mitigation Strategy
Planning Decision- 08 <i>Data Corruption</i>	Detected corruption of precipitation map or update	AC- None FC-Higher pilot workload due to less known of current precipitation PAX-None ATC- Slight incr in workload	AC-5 FC-4 PAX-5 ATC-5	Use AWR for hazard avoidance

Source: SC-206 current working paper

- Notes: 1. AC-air crew, FC-flight crew, PAX-passenger, ATC-air traffic control, AWR-airborne weather radar
2. Hazard classification: 1-Most severe, 5-least severe



Greasing the Wheel of Aircraft Certification: A vehicle for negotiating the requirements basis and the means of compliance





Participation Encouraged

- **RTCA SC-206/EUROCAE WG-76 meets quarterly; next in Norrköping, Sweden, June 11-15**
- **▶ Desire datalink communications industry participation to develop key documents and mitigate key issues**
- **OSED – Final Review and Comment, July-August**
- **SPR and INTEROP – Work underway, will intensify in August**