



Federal Aviation  
Administration

# Interface Testing Role in V&V



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# Goal of Interface Testing

- The outgoing data function or application provides data in the required format and with the required contents, using the required delivery mechanism.
- The incoming data function or application performs according to requirements when that data is in the correct format, has the required content, and was sent using the required delivery mechanism.
- The incoming data function or application performs according to requirements when the data is **\*not\*** in the correct format, or does **\*not\*** have the expected contents, or is **\*not\*** sent using the required delivery mechanism.

# Primary Products of the Interface Management

The FAA uses the Interface Requirement Document (IRD) to control interface requirements, while the Interface Control Document (ICD) controls interface design.

## ***These documents should:***

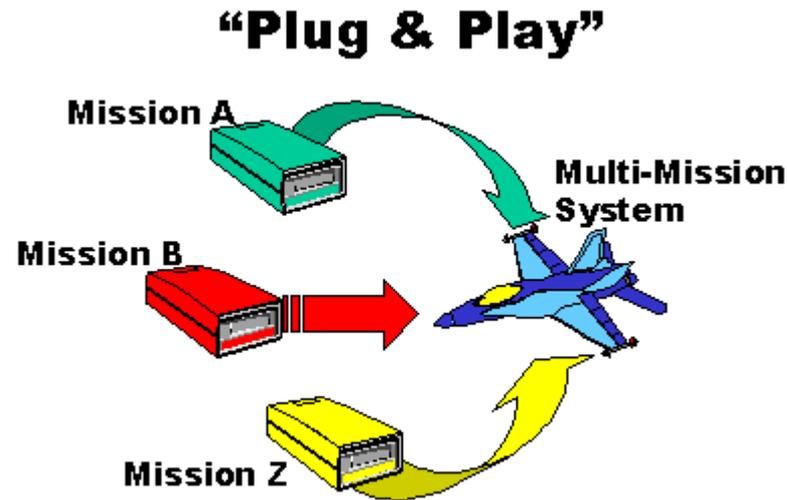
Define and illustrate performance, physical, and functional characteristics in sufficient detail to ensure that all details on the interface can be determined solely from the information in the IRD and ICD.

Identify required interface data and monitor submission of this data.

Control the interface requirements and design to prevent any changes to characteristics that might affect compatibility with other systems and equipment.

Communicate and coordinated interface requirements and design decisions as well as design changes to program participants.

# Plug and Play Interfaces for the NAS



*Plug and Play for the NAS usually has difficulty because the external interfaces have not been managed properly, which causes interface issues.*

# Some Interface Testing Issues

- **Some systems are old and do not meet today's data transmission standards.**
- **Systems that span over decades have different priorities like memory, power, or processing restrictions.**
- **Defined null fields are defined differently by different programmers.**



# Interface Management

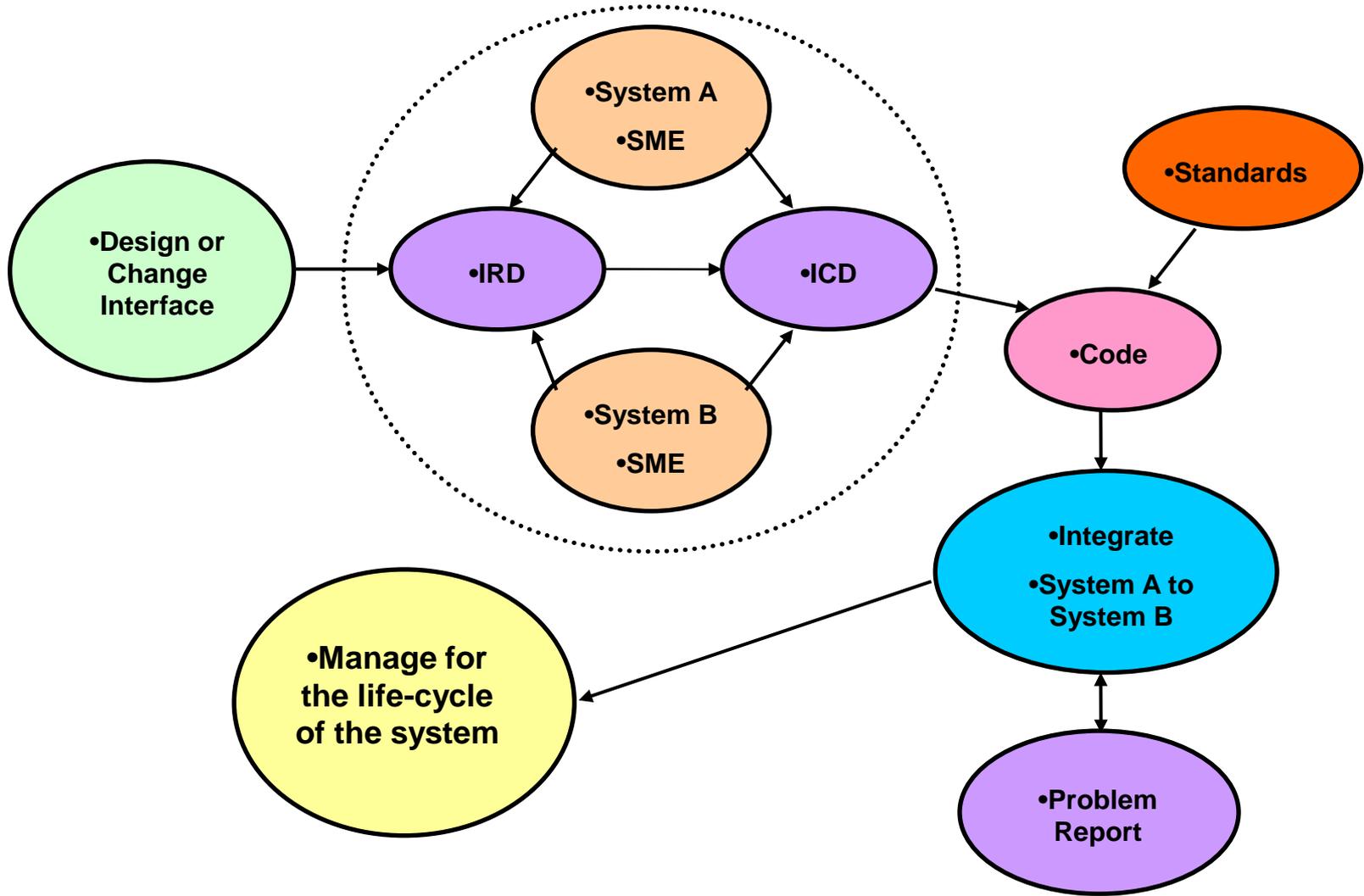
## Interface Management Definition:

- Identify, describe, and define interface requirements to ensure compatibility between interrelated systems and between system elements, as well as provide an authoritative means of controlling the interface design.

## Benefits of Interface Managements:

- Helps to ensure that all the pieces of the system work together to achieve the system's goals and continue to operate together as changes are made during the system's lifecycle.

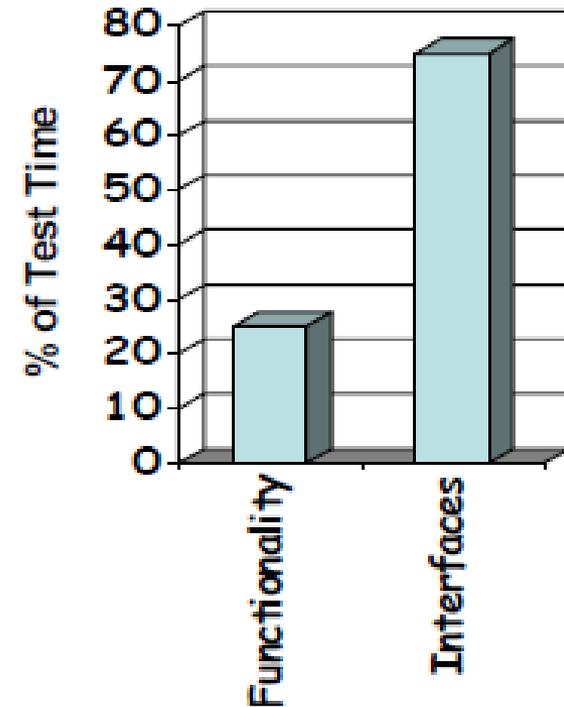
# My Interface Management Process



# The Importance Of Interface Management

## *Interface Issues Dominate End-to-End Integration*

- **System Interface Management**
  - **Testing**
    - **Functionality**
      - **Are the Specified Requirements Met?**
        - » Response Time
        - » Data Accuracy
        - » etc.
    - **Inputs and Outputs**
      - **Format**
      - **Content**
      - **Timeliness**

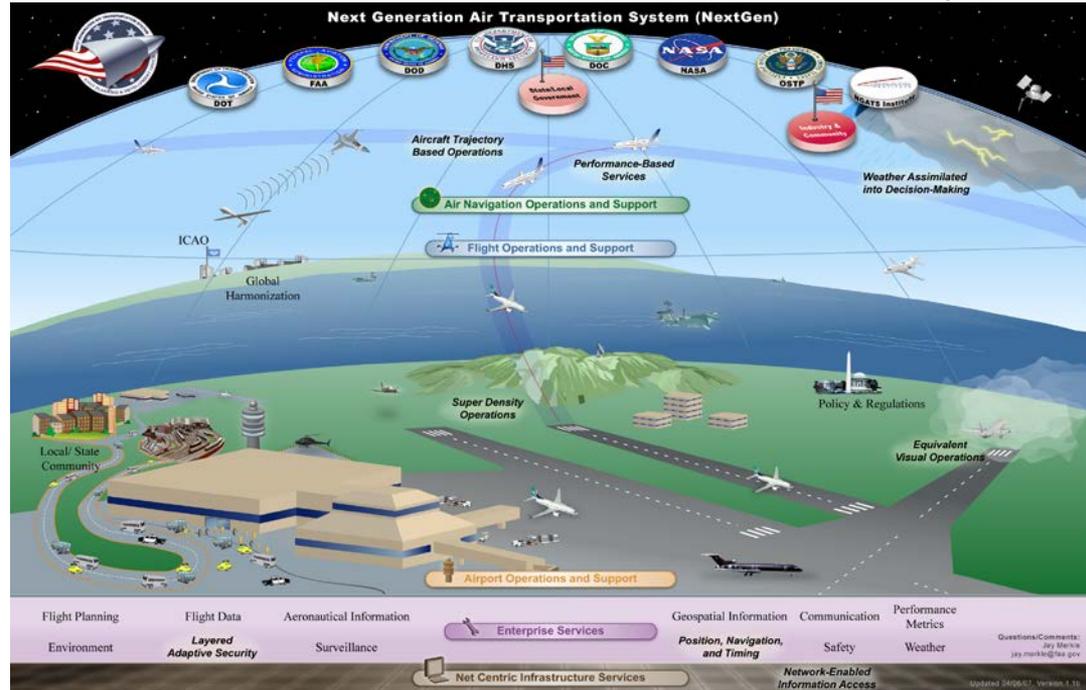


*Diagram from Stevens Institute of Technology*

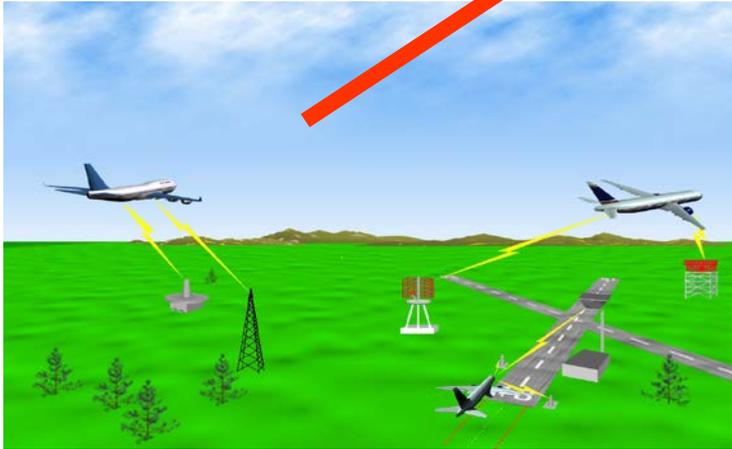
# NextGen High Level Ops Concept

Courtesy: JPDO

To This...

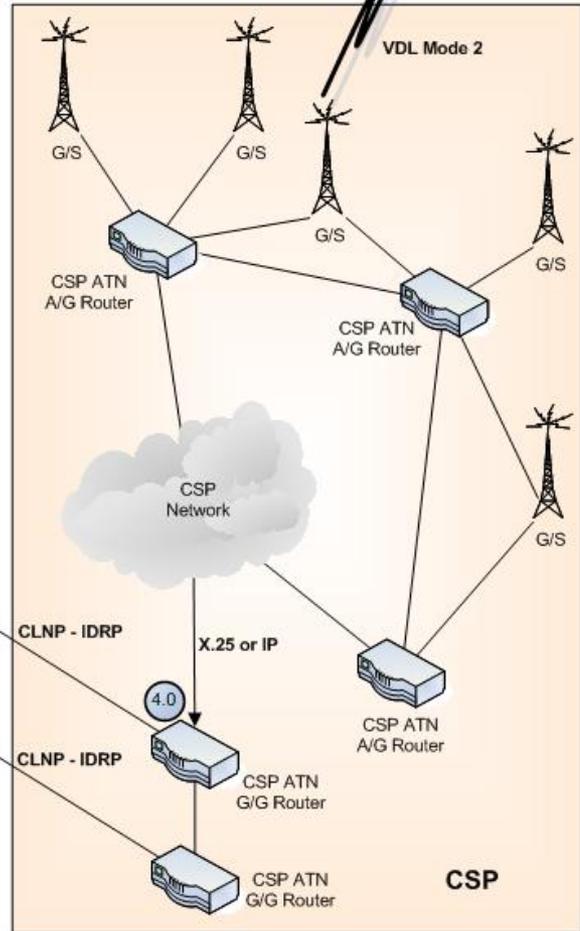
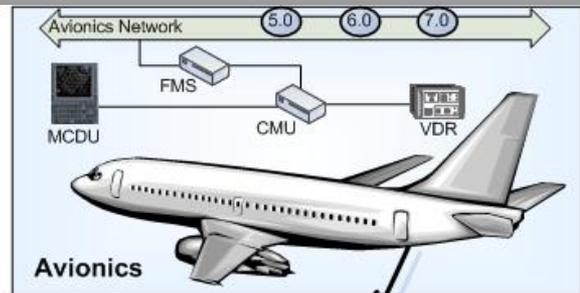
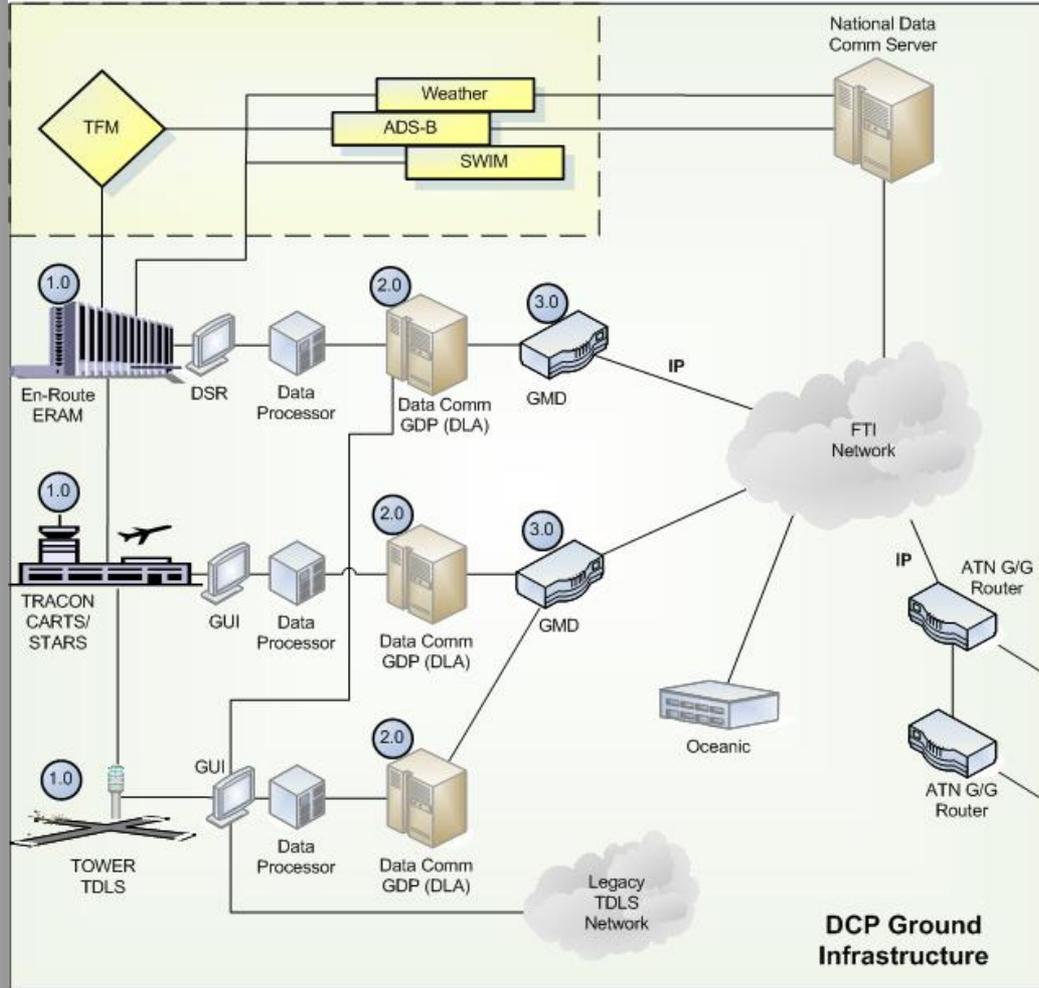


This...



**Coming for the Solution Sets...**

# Data Comm Air / Ground Communication CONTEXT Diagram



# My Lessons Learned?

- **Manage NAS interfaces**
- **Use an approved coding standard**
- **Audit interface coding early**
- **Document interface code well**
- **Retire systems at their end of lifecycles**
- **Verify that all home-grown code meets standards**
- **Do not assume your right get the correct answer from the proper Subject Matter Expert's (SME).**

# Conclusion

- **It is possible to keep interface issues to a minimum with a good NAS interface management program in place.**
- **Peer Review all interface documentation by the proper (SME)**
- **Do not over rely on modeling.**
- **Schedule enough time for live interface testing, so issues can be found and fixed before formal testing takes place.**



# End of Presentation

**QUESTIONS OR COMMENTS?**

