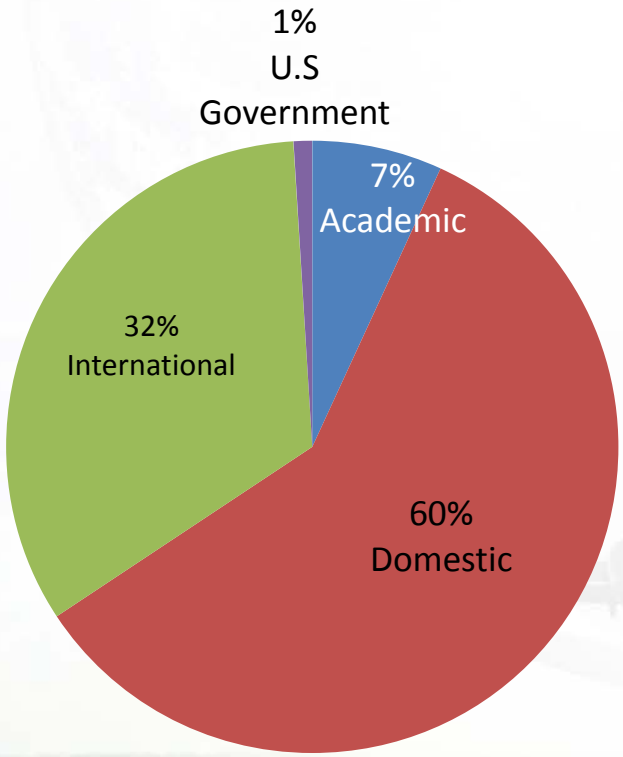
Global Information Management

RTCA Overview with Aeronautical Data Chain Insights from SC-217

Presented By: Michael Burski, FAA
on behalf of RTCA, Inc
Date: August 25, 2015

RTCA: A Unique Public-Private Partnership

Founded in 1935
Incorporated in 1991



> 490 Members

- Academia
- Airports
- Aviation service providers
- Government organizations
  - FAA, DOD, TSA, NASA
- Manufacturers (OEMs and after-market)
- Operators
  - Airlines, GA, Cargo, DOD
- Suppliers
  - Automation, Infrastructure, Avionics
- Labor
  - Pilots, Controllers, Dispatchers
- R&D organizations

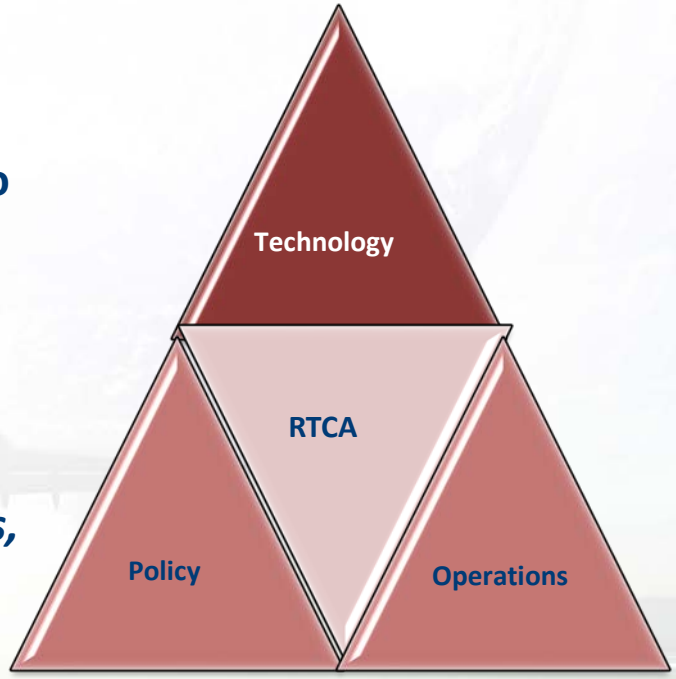
Purpose of RTCA

Working at the Nexus of Technology, Policy and Operations

Mission Statement

To be the premier Public-Private Partnership venue for developing consensus among diverse and competing interests on resolutions critical to aviation modernization issues in an increasingly global enterprise.

Our recommendations — whether technical, policy, financial or operational — lead to positive, timely, tangible and measurable results, returning value to all who participate.



International Harmonization

Federal Aviation Administration

Background – FAA Charter RTCA

- FAA charters RTCA to operate federal advisory committees
  - NextGen Advisory Committee (NAC)
  - Program Management Committee (PMC)
  - Special Committees (currently 23)
  - Tactical Operations Committee (TOC)
  - Others as FAA deems necessary
- Two year term – expires April 2017
- Charter approved by the Department of Transportation
- Charter Administered by FAA NextGen Organization
- GSA template & regulation defines scope, duties, recordkeeping, etc

Consensus Process

Diversity → Single Voice

- Consensus is the Essence of the Value that RTCA Brings to the Aviation Community
- Role Of Chairman(s) to Ensure Consensus
  - Consensus is not Always 100% Agreement
- Opportunity for All Voices to Be Heard
- Analytical Basis for Decision
- Transparent Process
  - Documentation captures discussion & resolution
- Members "Can Live With" & Support the Results

Special Committees (23)

- SC-135 - Environmental Testing (WG-14, WG-31)*
- SC-147 – TCAS/ACAS (WG-75)*
- SC-159 – GPS (WG-62, WG-28)*
- SC-186 - ADS-B (WG-51)*
- SC-206 - AIS and MET DataLink Services (WG-76)
- SC-209 - Mode-S Transponders (WG-49 and SC-209 are dormant, monitor ICAO recommendations)*
- SC-214 – Standards for Air Traffic Data Communication Services (WG-78)*
- SC-213 - Enhanced Flight Vision Systems and Synthetic Vision Systems (WG-79, dormant)*
- SC-216 - Aeronautical Systems Security (WG-72)*
- **SC-217 - Aeronautical Databases (WG-44)***
- SC-222 – AMS(R)S*
- SC-223 - Airport Surface Wireless Communications (WG-82)*
- SC-224 - Airport Security Access Control Systems
- SC-225 - Lithium Batteries & Battery Systems
- SC-227 - Standards of Navigation Performance (WG-85)*
- SC-228 – MOPS for Unmanned Aircraft Systems
- SC-229 – 406 MHz Emergency Locator Transmitters (ELTs) (WG-98)*
- SC-230 – Airborne Weather Detection Systems
- SC-231 – TAWS
- SC-232 - Airborne Selective Calling Equipment
- SC-233 - Addressing Human Factors/Pilot Interface Issues for Avionics
- SC-234 – PEDs (WG-99)*
- SC-235 – MOPS for Small Cell Non-Rechargeable Lithium Batteries
- Wake Vortex Tiger Team

* joint meetings and/or documents

Oversight, Guidance, Integration Provided by Program Management Committee (PMC)

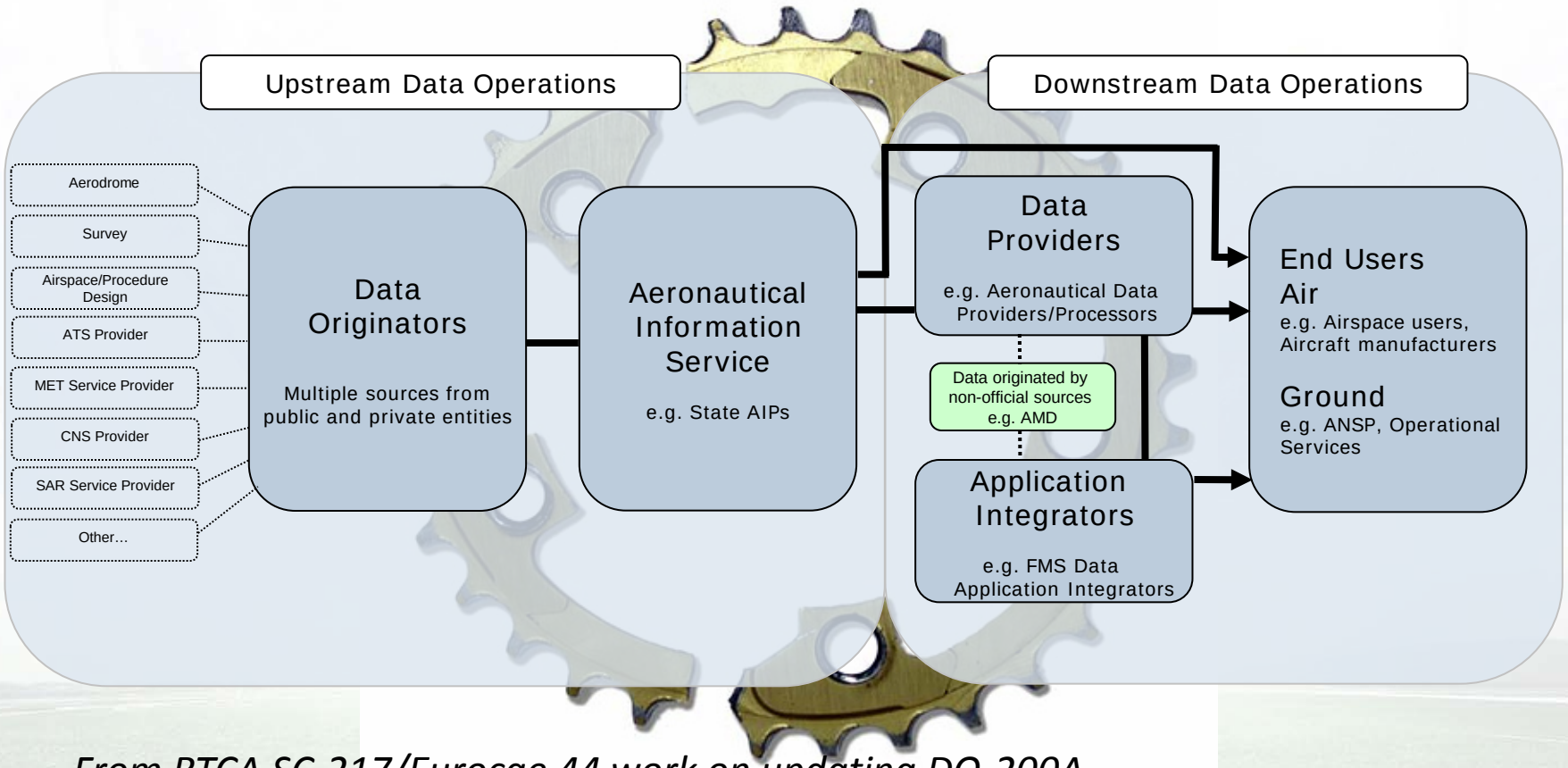
SC-217/WG-44 Terms of Reference

- DO-200B/ED-76A Standards for Processing Aeronautical Data
  - Top level Standard addresses complete aeronautical data chain
- DO-272D/ED-99D, User Requirements for Aerodrome Mapping Information
  - Includes requirements for Aerodrome Surface Routing Network (ASRN)
  - Addresses incorporation of SWIM service delivery
  - Includes UML as normative part of standard, which leads to auto-generated XML schema.
- DO-276C/ED-99C, User Requirements for Terrain and Obstacle Data
- DO-291C/ED-119C Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping
- Pending RTCA Program Management Committee (PMC) Decision to update DO-201A/ED-77, Standards for Aeronautical Information

DO-200B – The Complete Process Focus – From Data Origination to Use

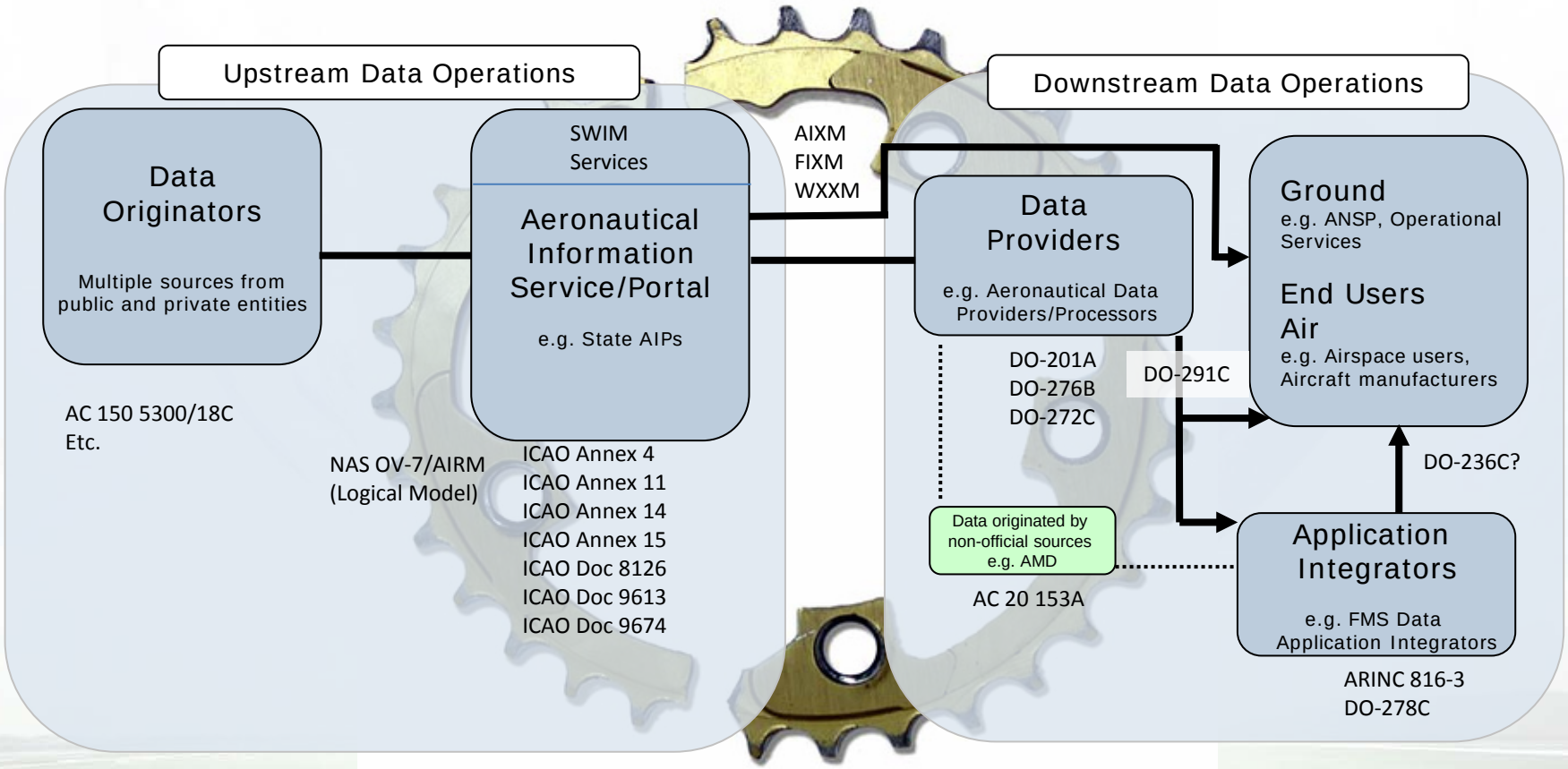
- Establishes recommended minimum requirements for the processing and quality management of aeronautical data.
- Establishes Data Quality Requirements (DQRs) characteristics:
  - Accuracy, resolution, assurance level, traceability, timeliness, completeness, and format.
- End to End Data Chain includes:
  - Utilization of Master Data Management Principles at origination including:
    - Establishment of Authoritative Sources
    - Identification of Stewards, Custodians, etc.
  - Identification and Development of SOA Information Services Under SWIM
  - Managing Access to SWIM Services
    - Access by Ground Systems
    - Access by Airborne Systems
  - Timely Delivery of Data and Updates to Users

DO-200B – Aeronautical Data Chain



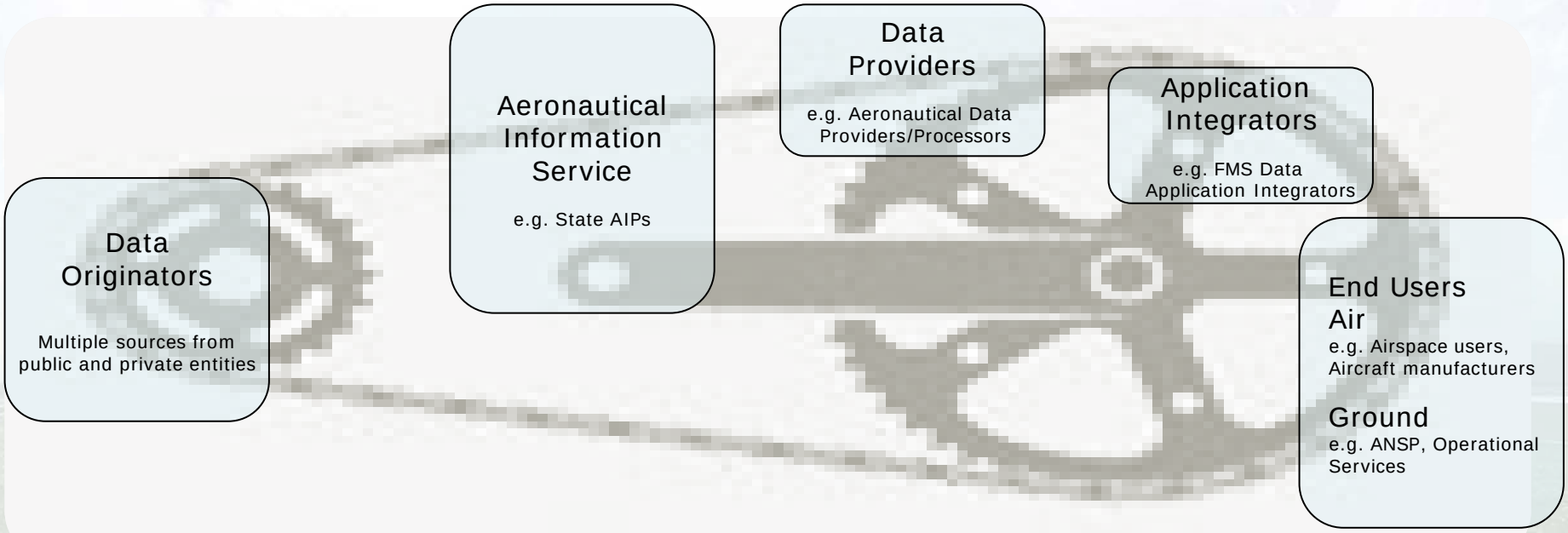
From RTCA SC-217/Eurocae 44 work on updating DO-200A

Applicable Standards

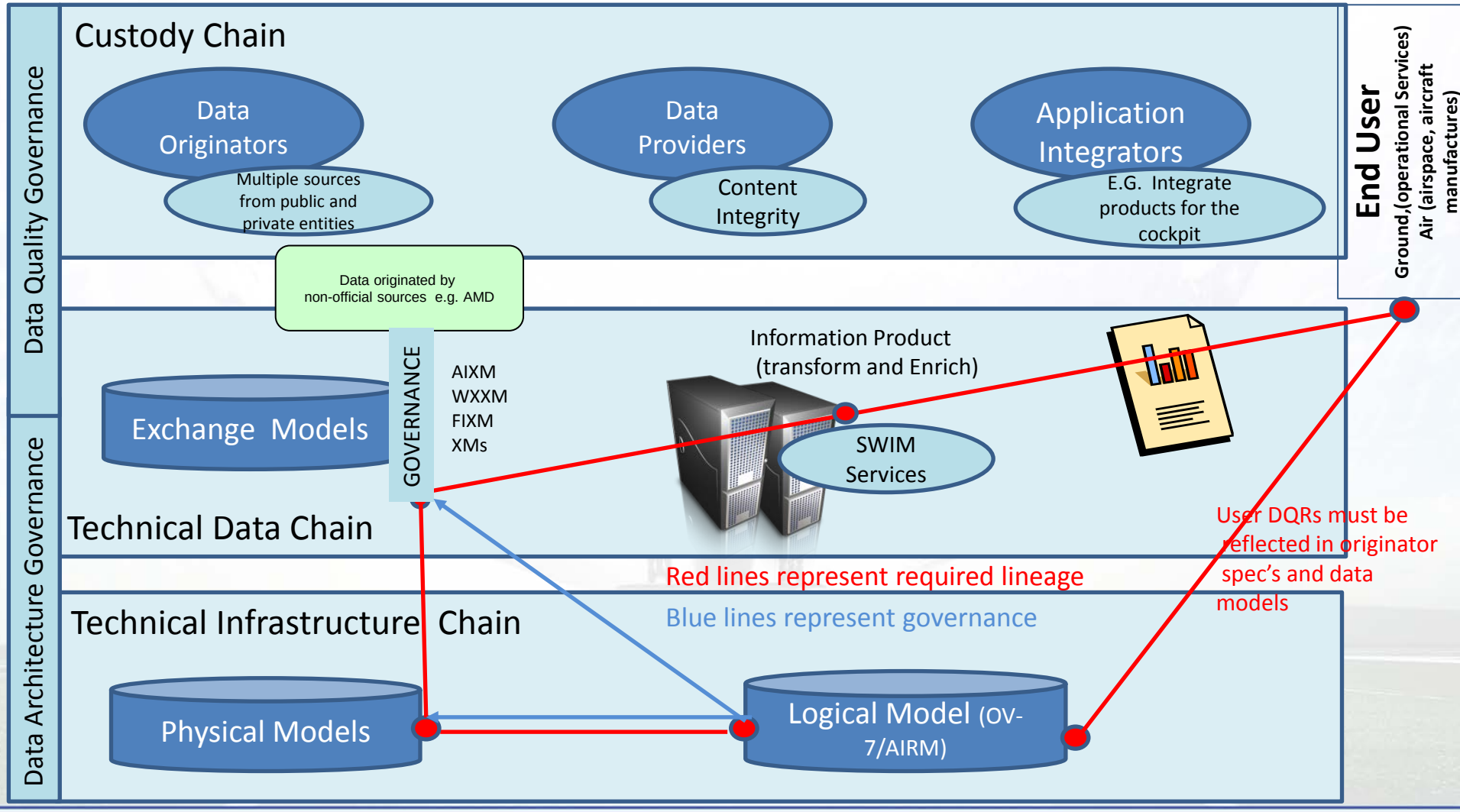


DO-200B - The Key to the Data Chain?

- End User Requirements !!!!
- Chain-links Managing Integrity to Assure Data Received Meets Data Need from Data Acquisition Through Data Exchange

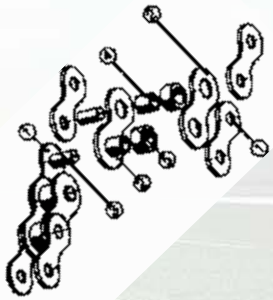


The Data Chain by Roles



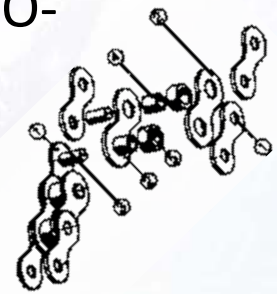
DO-272D and DO-276C – *User* Requirements

- DO-272D User Requirements for Aerodrome Mapping Data
  - Provides minimum requirements for content, origination, publication, and updating aerodrome mapping information.
  - Includes SWIM considerations in use of the standard
    - Identifies characteristics of AMDB information services to enable dynamic exchange of AMDB data in a SWIM environment.
    - References UML model as ***normative*** part of standard (resides in DO-291).
  - Includes Rules for Associated Aerodrome Surface Routing Network (ASRN):
    - Allows creation of unambiguous taxi route
    - Transmission of taxi routes in format usable to onboard applications
    - Displays taxi route on an aerodrome map
- DO-276C User Requirements for Terrain and Obstacle Data
  - Requirements defined for:
    - Area 1 – The State
    - Area 2 – The Terminal Area (vicinity of the aerodrome 2a, 2b, 2c, and 2d)
    - Area 3 – Aerodrome Movement Area (supports aerodrome mapping requirements)
    - Area 4 – The CAT II or III Operation Area
  - Incorporates Needs of the Helicopter Community

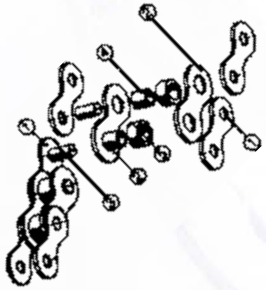


DO-291C – Interchange Standards for Terrain and Aerodrome Mapping Data

- Interchange Standards based on ISO 19100 (geographic information) series of standards
- Scope Covers Data Exchange of Features Documented in DO-272D and DO-276C
- Establishes a basis to implement a physical interchange format that supports the required data flow
- Normative parts of the standard represents an intermediate specification level between:
  - The abstract conceptual requirements in DO-272D and DO-276C, and
  - A Compliant Interchange Implementation
- An Informative XML Schema generated from the UML that could be used to generate a compliant information Service



Example: Segmenting the End-End "State" Data Chain into 3 Links



Service Provision

portal

External Users & Systems

Aeronautical Information Services

Airport Information Service | NOTAM Information Service | Other AI Integrated Information Services

FAA Systems

Request/reply

subscription

Subscription

Request/reply

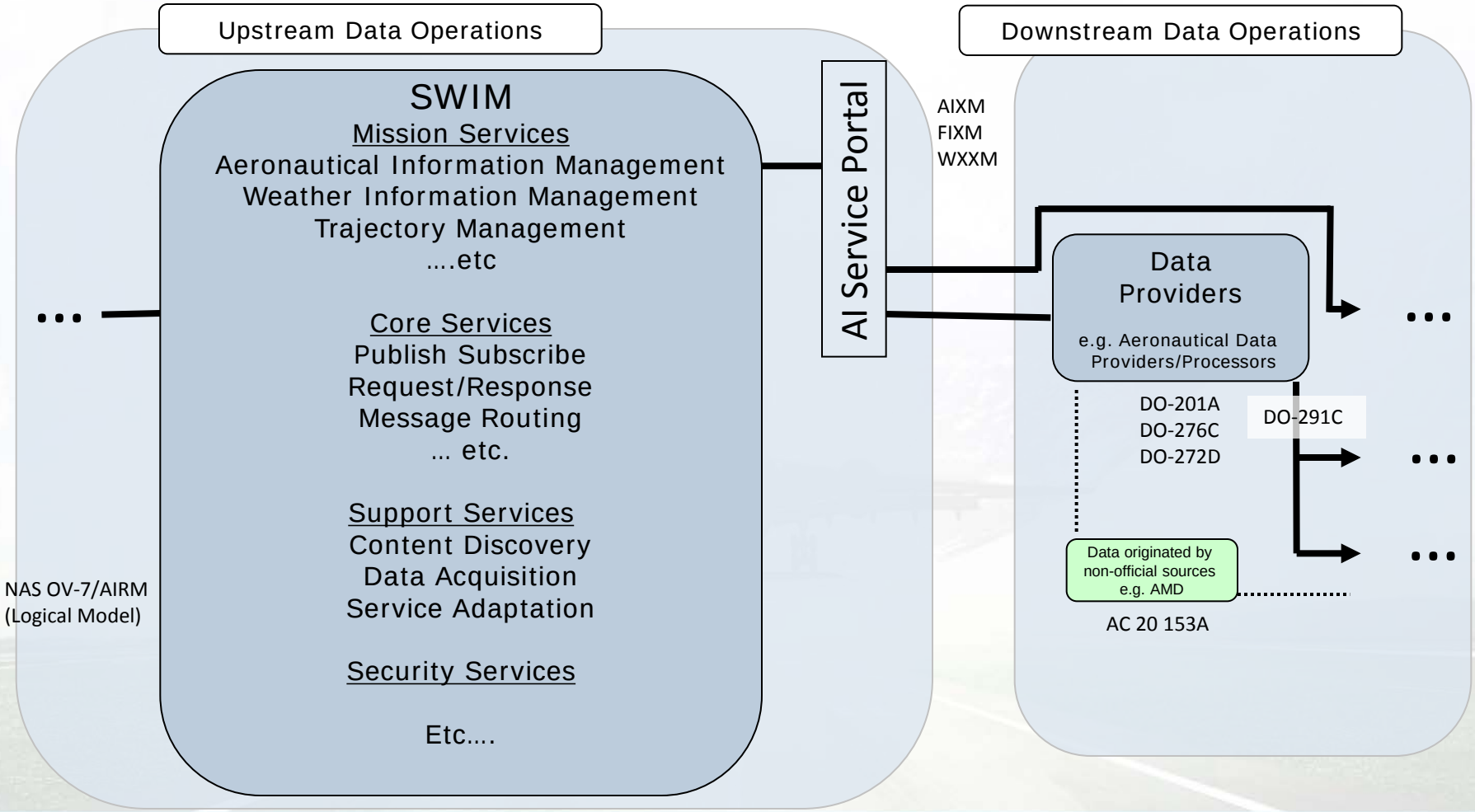
Upstream Data Operations

Service Development

Airport Survey → Airport Data Audit → Airport Data Authoritative Source

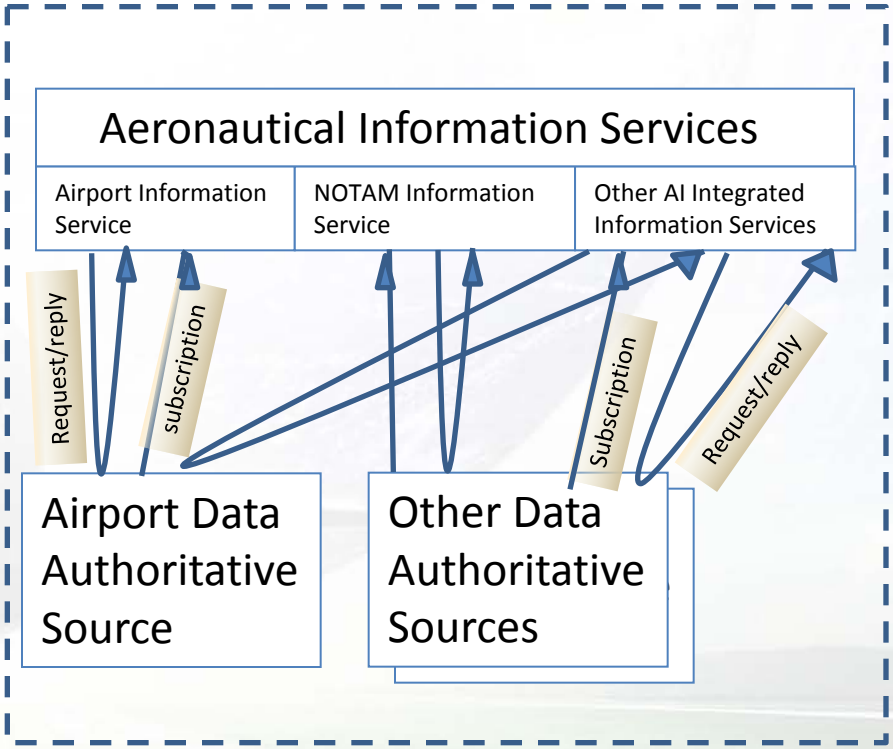
Other Data Authoritative Sources

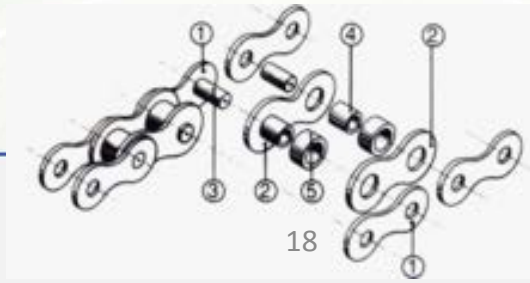
Example with SWIM Highlighted



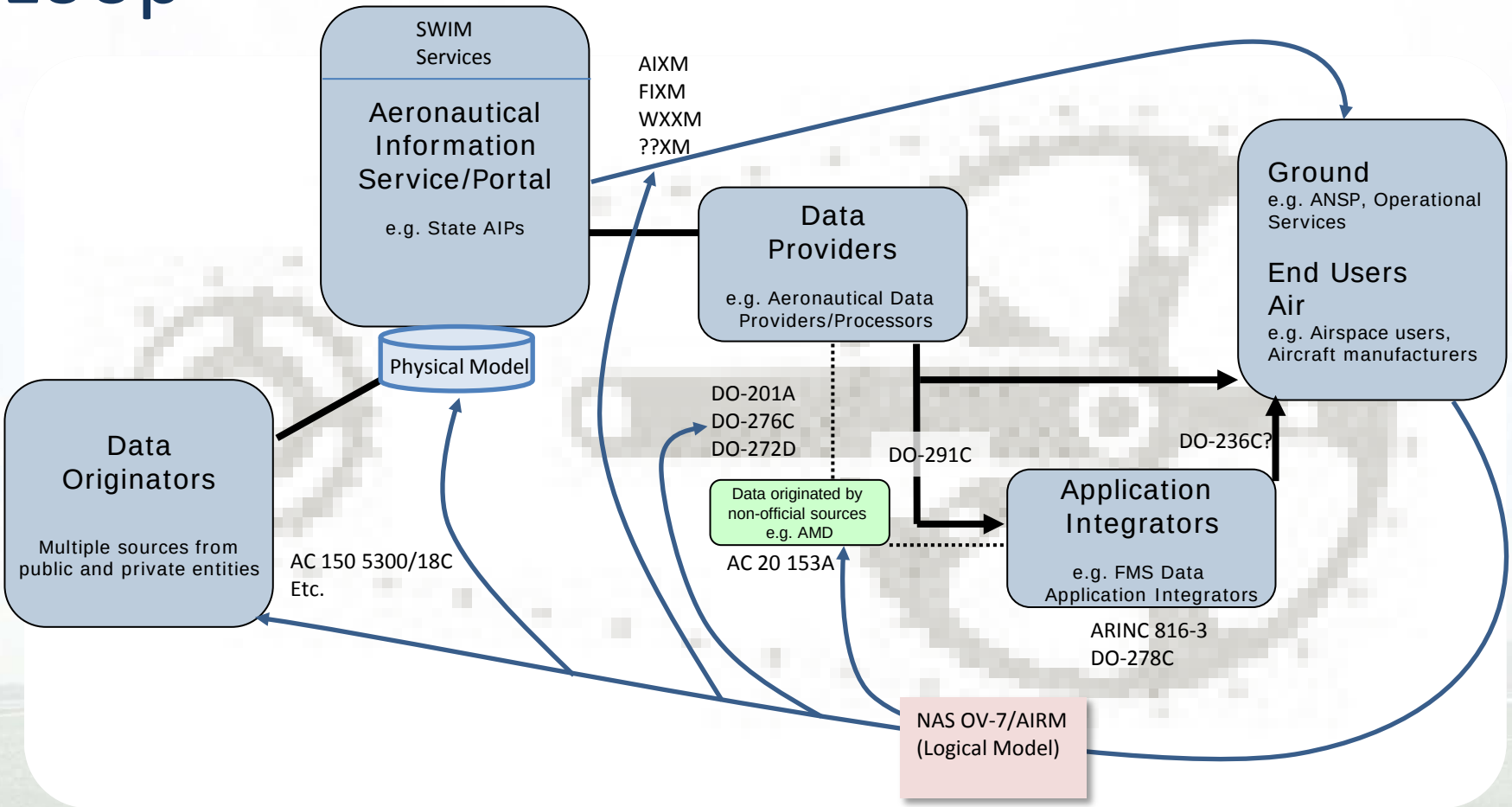
SWIM + Services

- Standards Based Service Oriented Architecture
- Services Registered and Accessible
- Service descriptions include what the service does, who provides the service, where it resides, how to access the service (Standards FAA-STD-065, -070, -073)
- Service Accesses Appropriate authoritative Data in Accordance with Service Definition and the Enterprise Architecture
- Authorization compliant with NIST 800-53 Rev 4 Authorization Package update for 2015 and compliant with NIST 800-162
- SWIM Provides:
  - Subscription based services
  - Request/Reply based services





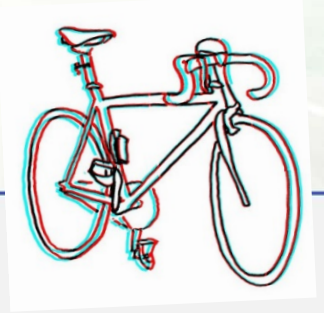
Summary – Closing the Loop



User DQRs must be reflected in originator spec's and data models

Summary

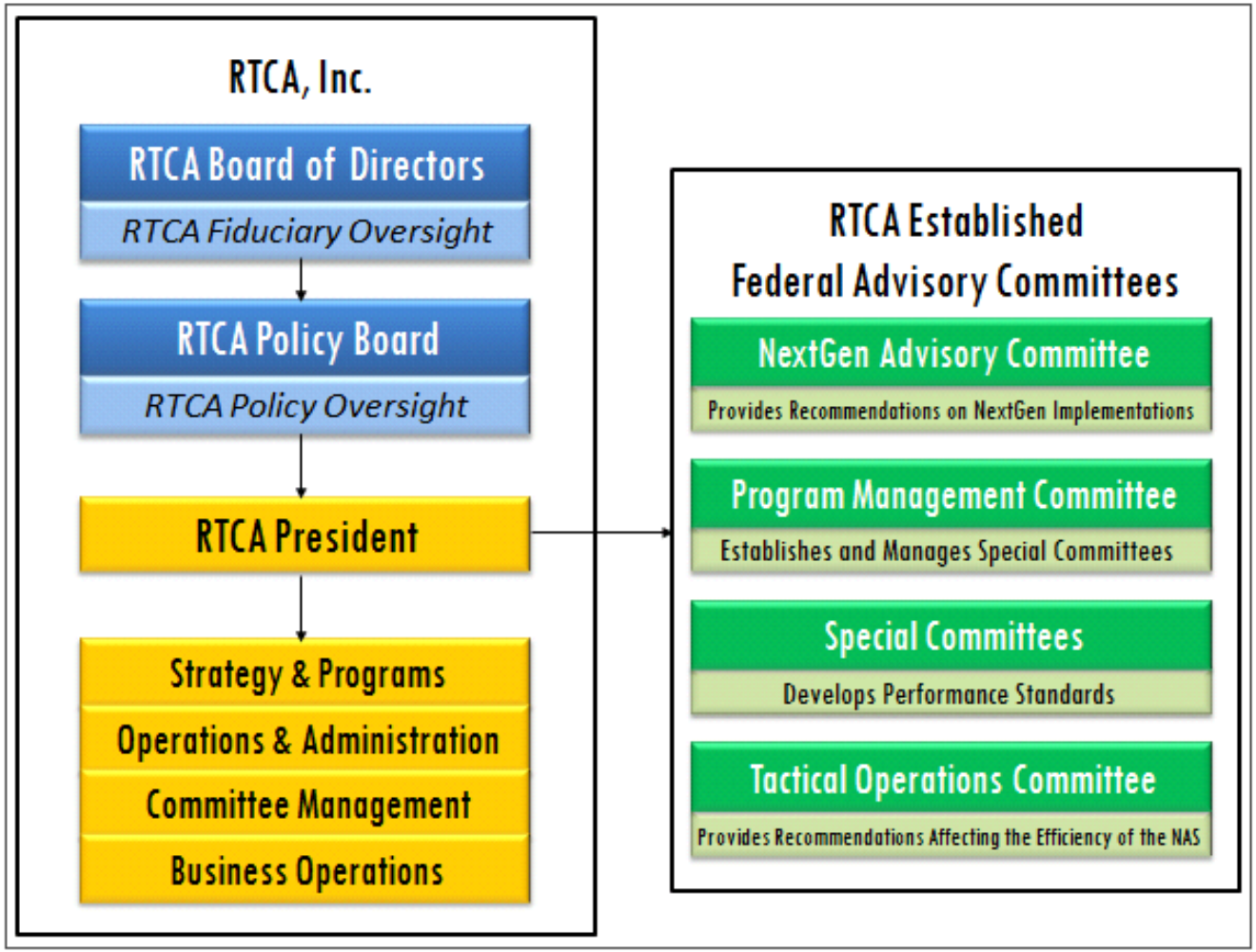
- DO-200B covers the complete Aeronautical Data Chain Beginning with Data Quality Standards that drive state data collection
- Data Quality is maintained by using authoritative data and insuring integrity throughout the chain by all users.
- DO-272 and DO-276 Document User requirements that must be reflected in data origination activities.
- DO-291 provision of UML as normative, provides basis for insuring authoritative data is consistent with exchanged data
- SWIM is a key enterprise-level capability required to support the broader sharing of information required to support the NextGen applications
  - Standard Web Feature Services access authoritative data, maintain integrity, and provide quality data for aggregation into products or delivery.
- The Data Chain points to the need for communities of practice to ensure user data requirements are reflected in data collection and throughout the data chain.
- RTCA is facilitating this entire aeronautical data chain standards development
- **Vive le Tour !!**



Questions

Back Up Slides

RTCA Corporate Structure



Board of Directors

Carl Esposito	**VP M&PM, Honeywell International, Inc. (Chair)**
Ed Bolen	**President & CEO, NBAA**
Mark Baker	**President & CEO, AOPA**
Nick Calio	**President & CEO, Airlines for America**
Craig Fuller	**President & Owner, The Fuller Company**
Margaret Jenny	**President, RTCA**

FACA Guidelines & Principles

- Promote Openness, Accountability & Balanced Viewpoints
- Membership Balanced Representation from Community
- Competing Interests Welcome
- Potential Conflicts of Interest Must Be Disclosed
- Limit FAA Membership, Serve as Ex-officio Members
- Committee Meetings Open to the Public
- Agendas, Meeting Minutes & Materials Posted on Web
- Parent Committee Not a “Rubber Stamp” of Subcommittee

RTCA Federal Advisory Committees

- Covers gamut from policy to operations to technology
- Policy - FAA and Industry investments, priorities and commitments
  - NextGen Advisory Committee (NAC)
  - Tactical Operations Committee (TOC)
- Technology - Minimum performance standards, basis for certification, safety & performance
  - Program Management Committee (PMC)
  - >20 Special Committees (SCs)

NextGen Advisory Committee (NAC)

Tackling Critical NextGen Issues

- 30 Executives from all Relevant Stakeholders
- 4 years, 14 meetings, over 30 recommendations
  - NextGen Capability Prioritization/Four Focus Areas
  - NAS Performance Metrics
  - Environmental Review Best-Capable, Best-Served Policy
  - Overcoming Impediments to PBN Implementation
  - Fuel Data Sharing
  - Metroplex
  - Equipage Incentives
  - Prioritization of Locations

Tactical Operations Committee (TOC)

Addressing Operational Issues

- Notice to Airmen (NOTAM) Modernization
- VOR Minimum Operating Network – GPS/PBN Transition
- Visual Area Surface 20:1 Obstacle Clearance
- National Procedures Assessment
- Regional Airspace Issues
- Class B Airspace
- Airport Construction
- GPS Adjacent Band

RTCA – EUROCAE Memorandum of Cooperation

RTCA
THE GOLD STANDARD FOR AVIATION SINCE 1935

EUROCAE

- Signed on 21st November, 2014 in Brussels
- By Margaret Jenny, RTCA President, and Jean-Paul Platzer, EUROCAE President

RTCA Committee Activities FY2014

- 60 Federal Advisory Committee Meetings
  - 305 Non-FACA meetings, Work Groups, Task groups, etc.
- 2,336 Attendees
- 358 Unique Organizations
- 4 New Special Committees
- 25 New or Updated Documents
- 11 Policy/Technical Recommendations

Aircraft Access to SWIM Harmonization

- Aircraft Access to SWIM Harmonization (AAtS H) Project
  - FAA sponsored this project
    - This was led by the Open Geospatial Consortium (OGC)
    - Significant support from representatives of FAA's AAtS initiative, **RTCA SC-206 AIS / MET Data Link committee**, ARINC 830 (AGIE) subcommittee and industry (The Boeing Company, Honeywell, Jeppesen, Teledyne, NorthStar, and Panasonic Avionics Corporation)
  - The purpose of this project was to identifying standards' efforts relevant to the provision of aircraft connectivity to the FAA's SWIM infrastructure that shares / communicates aviation data & services, as planned in the FAA's AAtS initiative.
    - Standard groups represented by **SC-206**, ARINC 830 and the OGC.
  - AAtS H resulted in two OGC engineering reports (14-073 and 14-086) as well as an ICAO working paper on international AAtS.

- FAA AAtS / IP Connected Aircraft Project
  - The purpose if this project is to develop a strategy for technology transfer & commercialization of the AAtS service.
  - Held workshops as part of the last three SC-206 Plenary meetings.

Need of Standards Harmonization

- Standards for information (data) exchange
  - AIXM, WXXM, FIXM, RTCA DO-291C (AMXM), ARINC 424 / 816 / 860
- Standards for information quality
  - ICAO Annex15, RTCA DO-201A, RTCA DO-272D, & DO-276C
- Standards for information processing
  - RTCA DO-200B
- Standards for AIS / MET Data Link Services
  - RTCA DO-308/324/339/340
- Recommended practices for display of AIS / MET Information
  - SAE ARPs 5289, 6467.