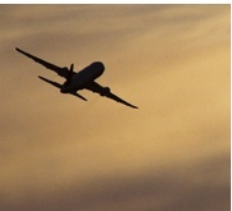


Data-link Elements and Role of Stakeholders – Reflections of an ANSP

(ICAO Seminar/workshop on the implementation of Ground Ground and Ground Air data link in the SAM Region)

Lima, Peru 10 -12 September 2012



Data-link - Enabling Benefits

- **Operational improvements using FANS1/A CPDLC and ADS-C data-link are predicated on certain communications, surveillance, and navigation requirements.**
- **We have an obligation to ensure that aircraft and operators are meeting these requirements.**
- **Operational improvements from FANS1/A data-link are often supported by other infrastructure e.g. ground system automation and AIDC if the data-link benefits are to be fully implemented with an appropriate level of safety.**
- **Improvements with global applicability also need globally agreed procedures.**



Data-link – A performance based system?

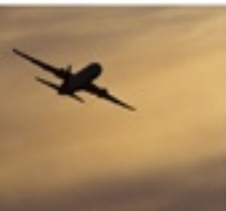
- **ICAO global plan requires a performance based system.**
 - **Regional Implementation Plan for performance based navigation in Asia/Pac.**
 - **A Regional Implementation Plan for performance based communication and surveillance has been recommended in Asia/Pac.**
- **ICAO Annex 11 – requires monitoring of performance to verify an acceptable level of safety continues to be met**



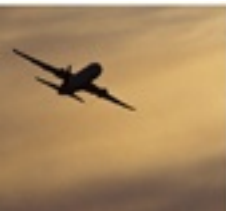
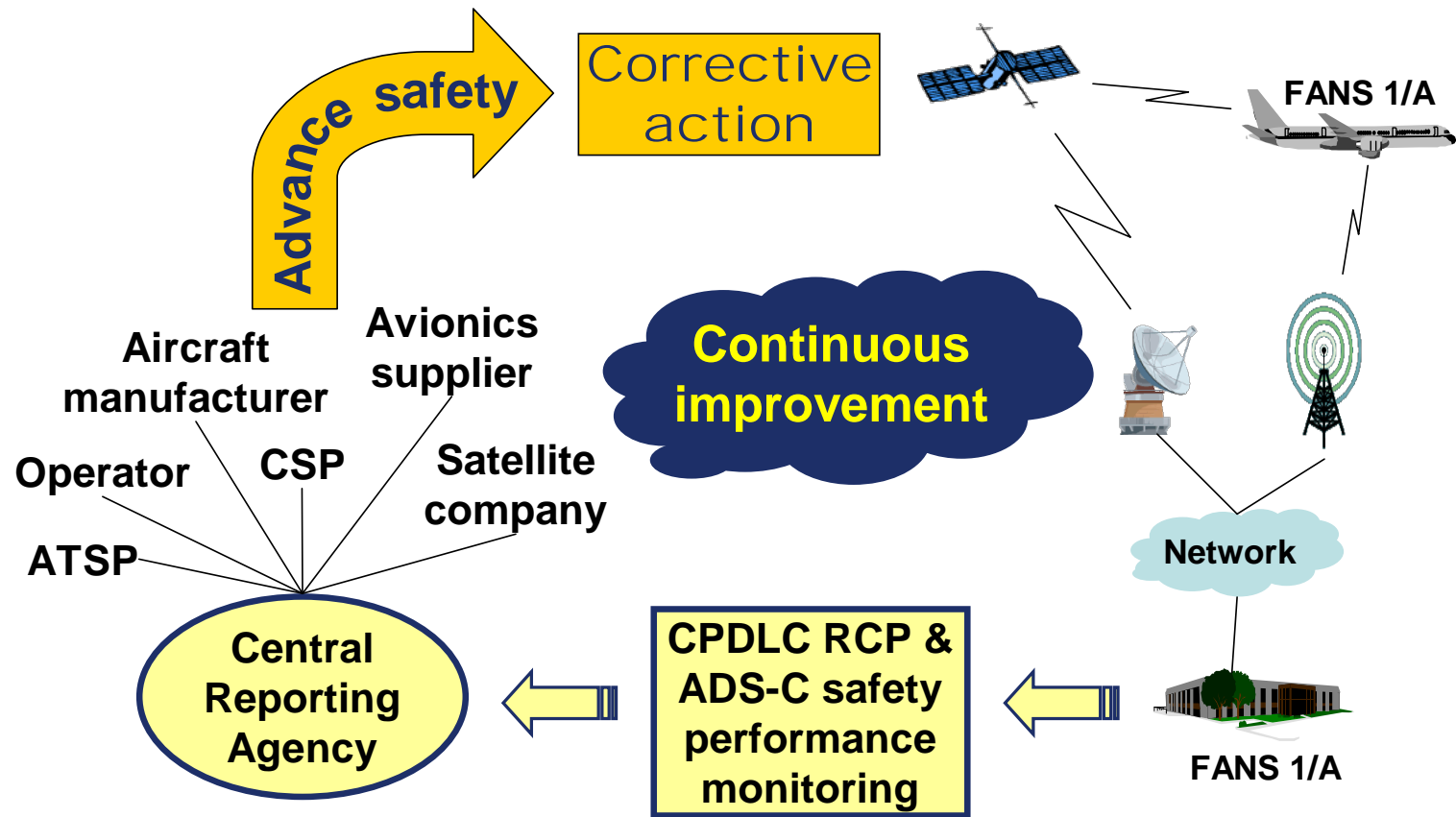
Post Implementation Monitoring

Annex 11

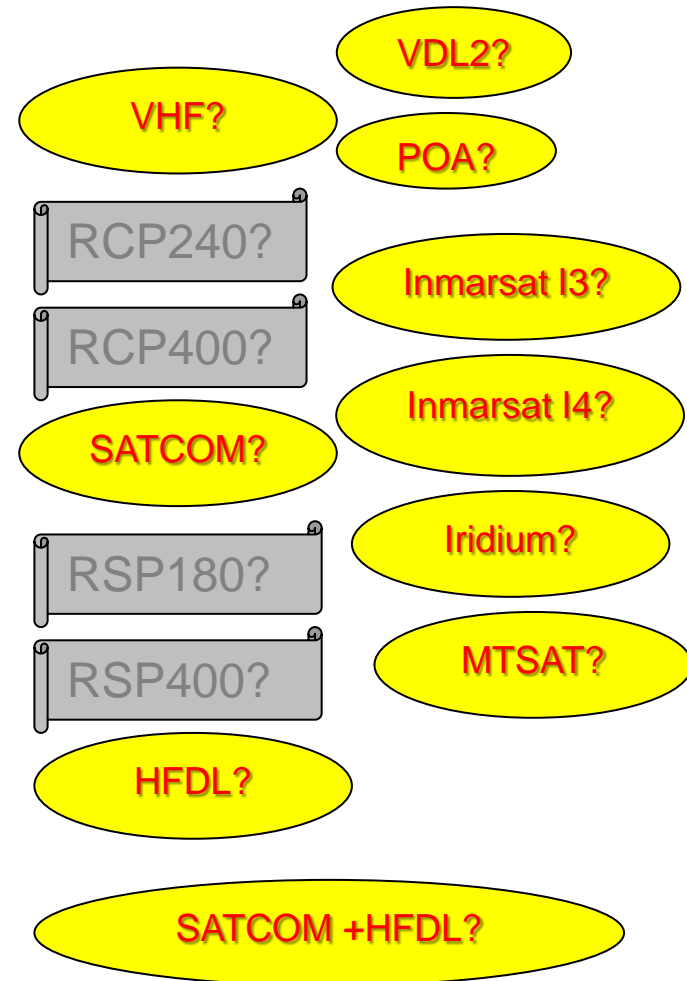
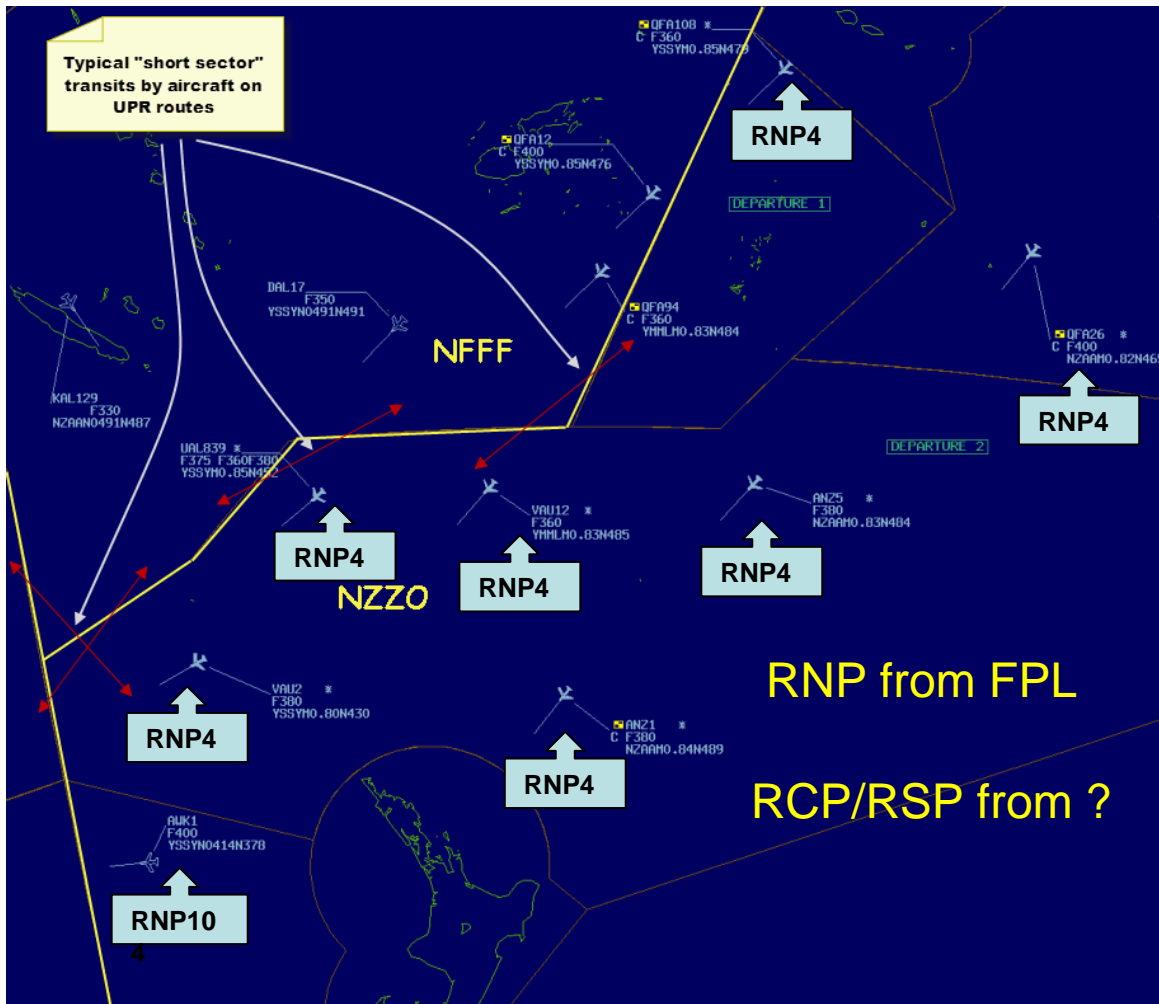
“Any significant safety-related change to the ATC system, including the implementation of a reduced separation minimum or a new procedure, shall only be effected after a safety assessment has demonstrated that an acceptable level of safety will be met and users have been consulted. When appropriate, the responsible authority shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met”



A Performance Based System ----

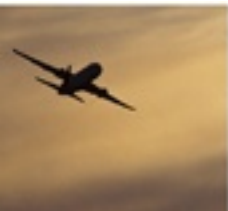


Missing bits of jigsaw – RCP? - RSP?



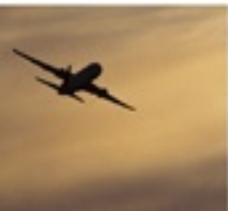
Different implementations = Different performance

Fleet	CSP1	CSP2	I3	I4	MTSAT	Iridium	HF	SAT+HF
1	✓		✓					
2		✓	✓					
3		✓	✓		✓			
4		✓	✓		✓			
5		✓	✓					
6	✓		✓					
7	✓	✓	✓					
8		✓	✓					
9			✓			✓		
10	✓	✓	✓					✓
11	✓		✓	✓				✓
12		✓	✓	✓				✓
13	✓			✓				
14		✓		✓				
15	✓						✓	



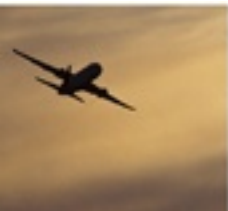
RSP/RCP – ICAO 2012 FPL

- **Currently, there is potential for an ANSP to misapply Air Traffic Services to an operator or aircraft type.**
- **Current amendment to Doc4444 for FPL 2012 makes provision for RCP allocation in Field 10 but does not assign values to the designators.**
- **No similar provision was made for RSP allocation in Field 10 but does mention use of SUR/ in Field 18.**
- **ICAO OPLINKP have agreed that:**
 - **For RCP Field 10a - P1 = RCP240 and P2 = RCP400**
 - **For RSP Field 18 use SUR/RSP180 or SUR/RSP400**
- **Work in progress**



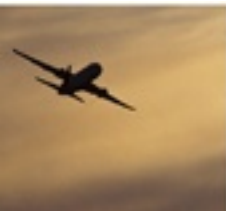
ANSP – Ground System Automation

- **With proliferation of different aircraft equipment, technology, and wide variations in observed performance, there is an urgent need for improved ground system automation.**
- **While some guidance is provided in the GOLD 3.1.2 additional guidance for ground system automation that will assist controllers to enable benefits. Under consideration:**
 - **Mitigate risk of inadvertent application of D50/D30 to RNP qualified aircraft that do not qualify by RSP/RCP using system interlocks.**
 - **Improved controller HMI**



ANSP – Supporting infrastructure

- **Implementing FANS1/A CPDLC and ADS-C in isolation without considering the supporting infrastructure will restrict/delay operational benefits:**
 - **In Oceanic/Remote airspace significant benefits can be realised through DARP.**
 - **DARP requires AIDC to communicate route changes to downstream ANSP. No AIDC = No DARP.**
 - **Effective performance monitoring and problem reporting required.**



GOLD – Global Operational Data-link Manual

- **A significant step towards global standard procedures:**
 - **Appendix B & C provides guidance on RCP and RSP performance specifications.**
 - **Appendix D provides guidance on post implementation monitoring and corrective action.**
 - **Chapter 4 provides Controller procedures**
 - **Chapter 5 provides Flight Crew procedures**

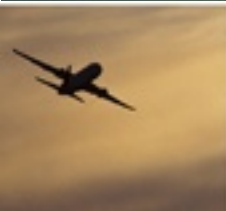




Thank you

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GOLD – Chapter 3

ATS data link provision and Operator readiness



Federal Aviation
Administration

Presented to:

ICAO Seminar/Workshop on the
Implementation of Ground-ground
and Air-ground Data Links in the
SAM Region

By: Tom Kraft

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Date: 12 September 2012



GOLD

Introduction – GOLD, Chapter 3

- **ATS CPDLC and ADS-C data link service provision**
- **Operator readiness**
- **Flight Planning**
- **Additional – Flight management computer waypoint position reporting (FMC WPR)**



Validation of ATS provision

- **Managing safety – system safety**
- **Confirming active CPDLC connection – CDA**
- **Using free text**
- **Complying with interoperability, safety and performance standards (GOLD, Apx B, C & D)**
- **Establishing procedures (GOLD, Chapter 4)**
- **Establishing training/qualification programs**



ATC automated data link functions

- **Correlating logon request with flight plan**
- **Managing CPDLC connections/transfers**
- **Managing ADS contracts and reports**
- **Processing emergency messages**
- **Automating responses, including those for unsupported messages**
- **Processing abnormal behavior of system**



Contractual considerations for CSP

- **Performance of communication services**
 - GOLD, Appendices B and C
- **Data link message delivery, including messages from non-contracted operators**
- **Notification of communication service degradation, outages, maintenance and restoration**
- **Monitoring and data retention requirements**



Interfacility agreements

- **CPDLC connection transfers**
 - Additional considerations for aircraft transiting small data link area
- **ADS contract management with neighboring control areas**
- **Voice frequency assignment by CPDLC**



Aeronautical information (1 of 2)

- **Notification of air traffic data link services**
 - Area of applicability
 - Special considerations, limitations, restrictions
 - Prescription of RCP/RSP specifications
 - Operator requirements, including aircraft equipage
 - Flight crew position and revised time estimate reporting via CPDLC, HF voice or
 - ADS contracts (periodic interval and event)
 - Flight plan requirements



Aeronautical information (2 of 2)

- **Once ANSPs have notified operators of air traffic data link service, then ANSP should issue notification(s) of service status, including**
 - Degradation
 - Outages
 - Maintenance
 - Restoration



Monitoring and data recording

- **Post-implementation monitoring**
 - Annex 11, paragraph 2.27.5
 - GOLD, Appendix D
- **Data retention – 30 days**
- **CSP monitoring and data retention**
 - contractual consideration



Operator eligibility (1 of 2)

- **Operational authorization with the State of Registry or State of the Operator**
 - Procedures (GOLD, Chapter 5)
 - Flight crew training and qualification,
 - Aircraft maintenance,
 - Minimum Equipment List (MEL)
 - User modifiable software (e.g. ORT)
 - Service agreements with the CSP
 - Aircraft equipment approved for intended use



Operator eligibility (2 of 2)

- **Regional/State Monitoring Agencies**
 - Establish procedures for flight crew and operations staff to report problems
 - Provide contact information and participate in problem investigations

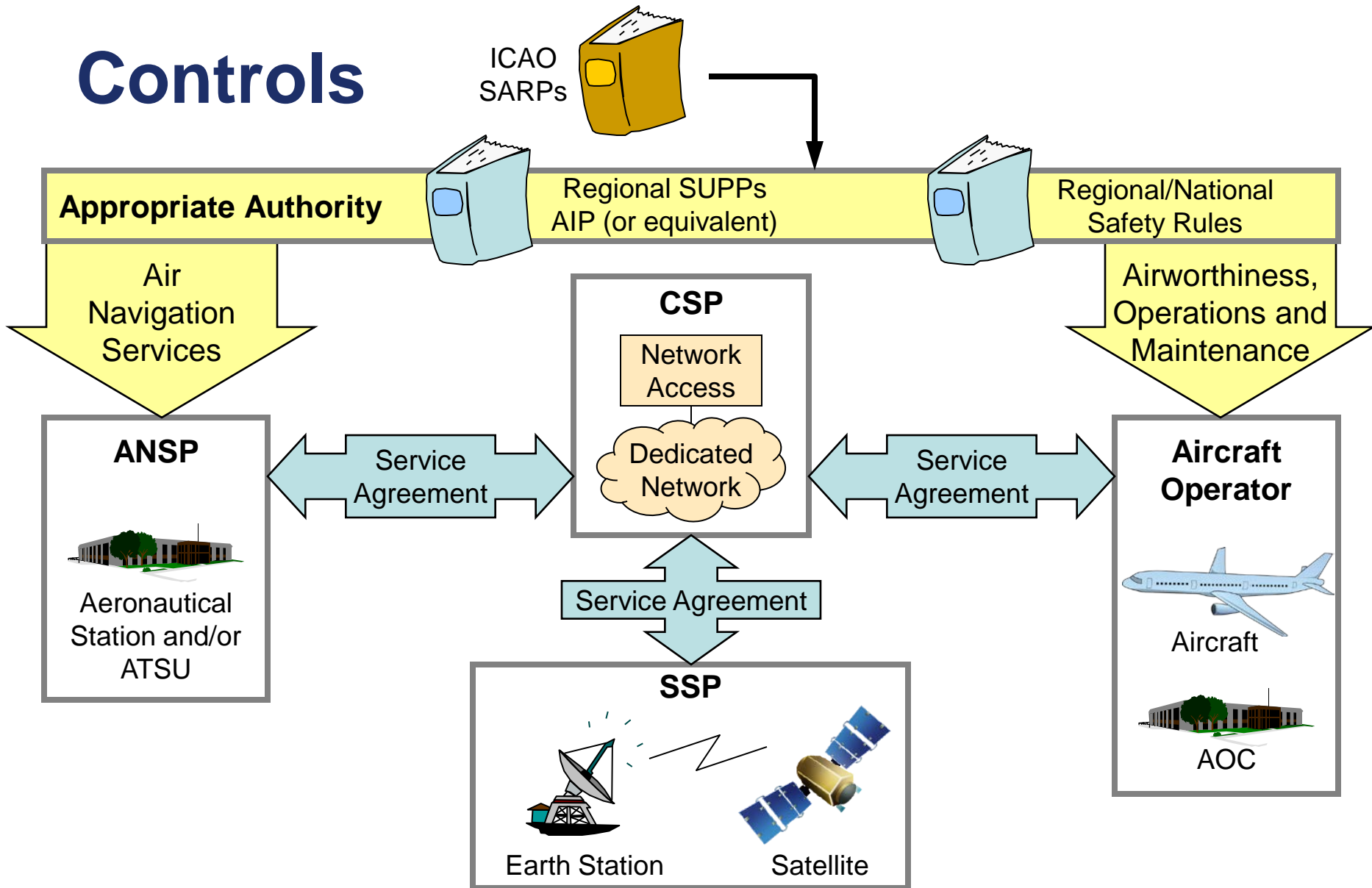


Flight plan

- **The ANSP needs to publish its policies, procedures or any special circumstances applicable in individual State and/or FIRs**
 - (e.g. Regional SUPPs, AIP and/or equivalent publication)
- **The operator needs to**
 - ensure that the planned use of data link for the flight will be In accordance with appropriate aeronautical information publications
 - file the flight plan in accordance with ICAO Doc 4444, Appendix 2, and appropriate aeronautical information publications



Controls



Summary

- **Planning and ensuring controls are in place will aid successful implementation**
 - Validation of air traffic data link services
 - ATC automated data link functions
 - Service agreements for communication services
 - Interfacility agreements
 - Regional SUPPs and AIPs – Notifications
 - Monitoring and data recording
 - Operator eligibility





