ICAO provisions for data link implementation

Seboseso Machobane
ATM Regional Officer, ESAF Office

Operational Data Link Familiarization Seminar, Nairobi, Kenya, *2 – 6 November 2015*

- GANP and ASBUs
- AFI Air Navigation System Implementation Action Plan
- ICAO SARPs, PANS and Manuals

GANP and ASBUs

GANP – A Global Roadmap

- The Global Air Navigation Plan
  - Appendix to FANS 1992
  - GANP Ed. 1, 1998
  - GANP For CNS/ATM Systems. 2001
  - Ed. 3 GANP ~~For CNS/ATM Systems~~, 2006
  - Ed. 4 2013, GANP-2013-2028
  - Ed. 5…..

New National/Regional Plans - interoperability challenges

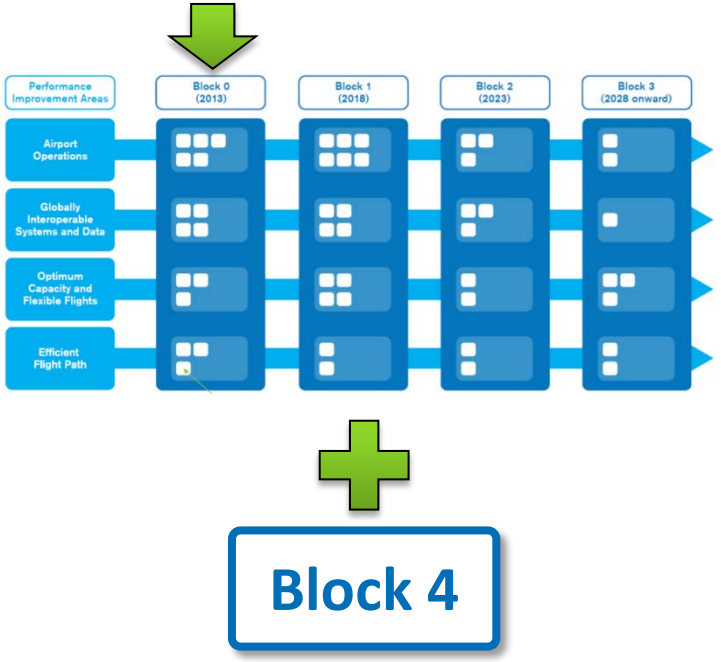
Examples..

Many Regional and National ATM modernization programmes being developed worldwide

- They are following ICAO's Global Air Navigation Plan and Operational Concept, **but** are different in their own way
- thus resulting in interoperability challenges

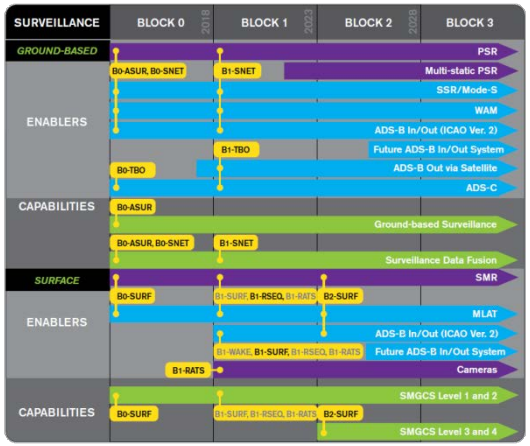
GANP – A Global Roadmap

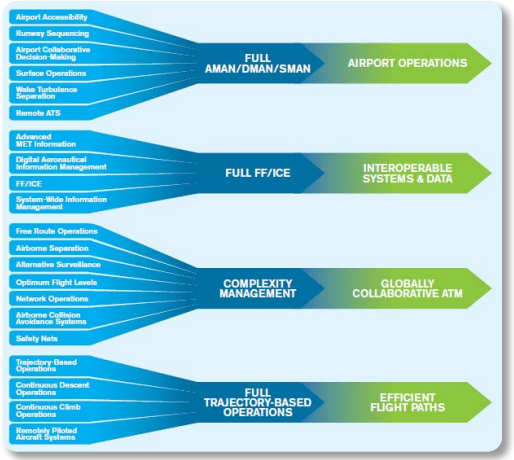
- The Global Air Navigation Plan
- The Roadmaps
- The Content



GANP – A Global Roadmap

- The Global Air Navigation Plan
- The Roadmaps



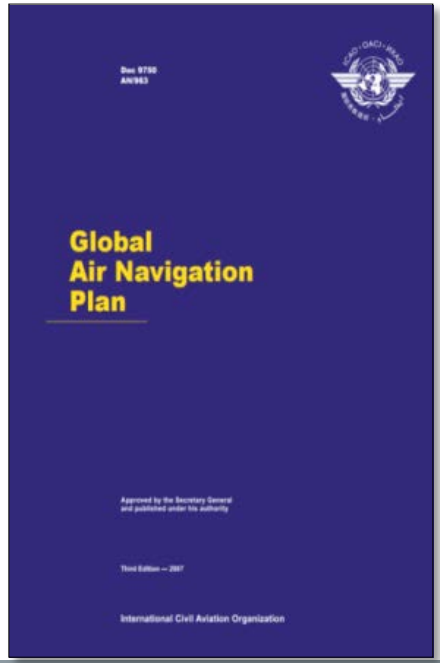


GANP – A Global Roadmap

- Provides certainty :
  - In equipage
  - For industry
  - For investment
  - In research and development direction

GANP Ed. 4 Builds on Ed. 3 Global Plan Initiatives (GPIs)

- GPI-9: Situational Awareness
  - Data link-based surveillance supporting cockpit traffic display
- GPI-17: Data link applications
  - From less complex (e.g. pre-departure clearance, oceanic clearance, D-ATIS, automatic position reporting) to more advanced ATC applications including CPDLC
- GPI-22: Communication Infrastructure
  - availability of appropriate aeronautical mobile and fixed communication capabilities (voice and data)



GANP Policy Principles

1. Commitment to the Implementation of ICAO's Strategic Objectives and KPAs
2. Aviation Safety is the highest priority
3. Tiered Approach to Air Navigation Planning
4. Global Air Traffic Management Operational Concept (GATMOC)
5. Global Air Navigation Priorities
6. Regional and State Air Navigation Priorities
7. Aviation System Block Upgrades (ASBUs), Modules and Roadmaps
8. Use of ASBU Blocks and Modules
9. Cost Benefit and Financial issues
10. Review and Evaluation of Air Navigation Planning

ICAO's 10 Key Air Navigation Policy Principles

06 Regional and State Air Navigation Priorities

– ICAO regions, sub-regions and individual States through the PIRGs should establish their own Air Navigation priorities to meet their individual needs and circumstances in line with the Global Air Navigation Priorities

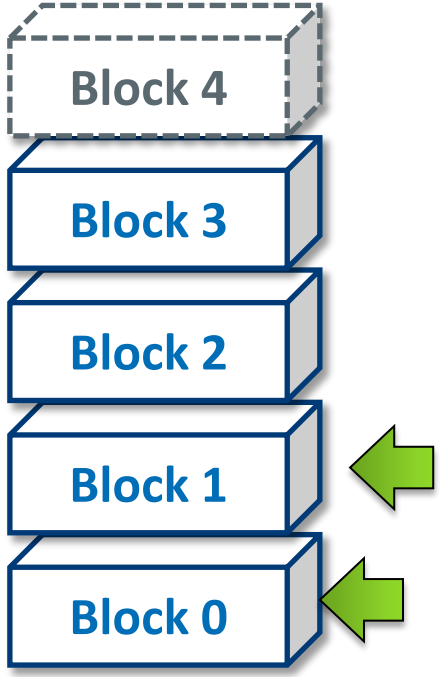
ICAO's 10 Key Air Navigation Policy Principles

08 Use of ASBU Blocks and Modules

- Although the GANP has a global perspective, it is not intended that all ASBU modules are to be applied around the globe.
- When the ASBU blocks and modules are adopted by regions, sub-regions or States they should be followed in close accordance with the specific ASBU requirements to ensure global interoperability and harmonization of air traffic management
- It is expected that some ASBU Modules will be essential at the global level and therefore may eventually be the subject of ICAO mandated implementation dates.

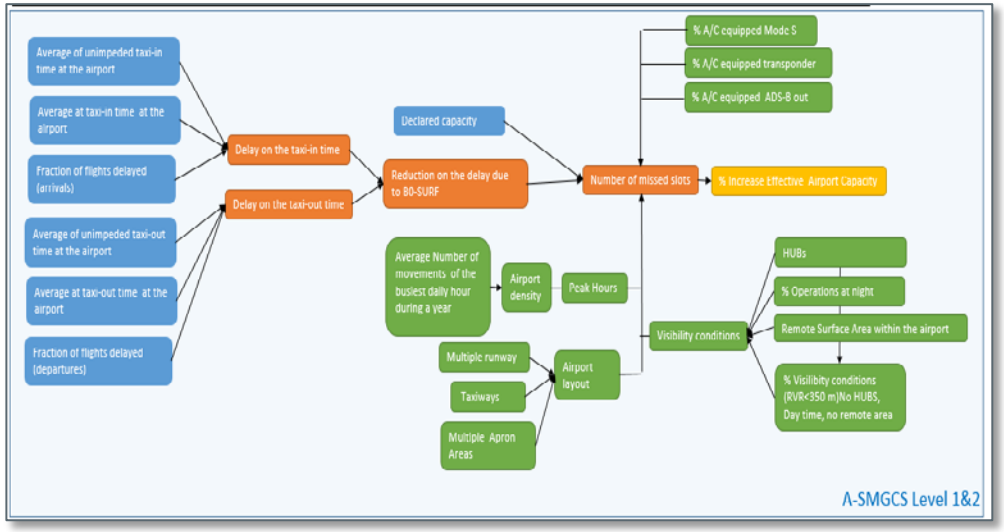
ASBUs as Air Navigation Building Blocks

- Current Best Practices
  - Gap analysis
  - Implementation
- Plan for:
  - Safe
  - Effective
  - Efficient

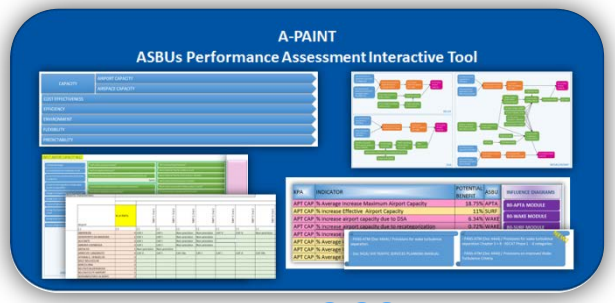


ASBUs as Air Navigation Building Blocks

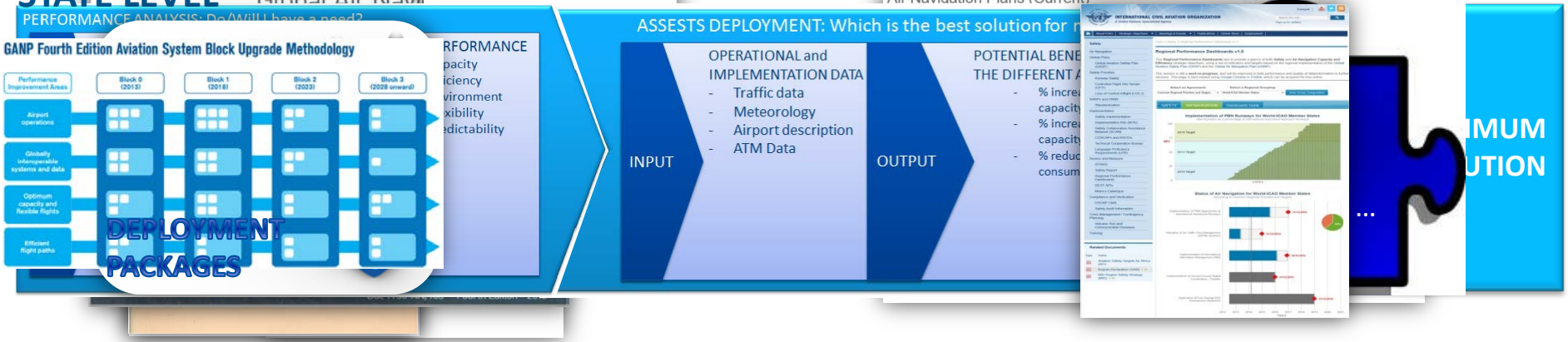
- When:
  - Voluntary
  - Business Case
  - Introducing the influence diagrams



GLOBAL LEVEL FALL 2016



STATE LEVEL



REGIONAL LEVEL DEC 2015

Relevant Modules in ASBU

Performance Improvement Area 4:
Efficient Flight Paths – Through Trajectory-based Operations

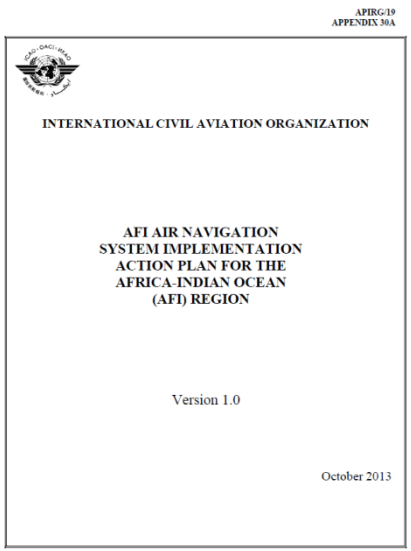
Block 0	Block 1	Block 2	Block 3
B0-TBO **Improved Safety and Efficiency through the initial application of Data Link En-Route** Implementation of an initial set of data link applications for surveillance and communications in ATC.	B1-TBO **Improved Traffic Synchronization and Initial Trajectory-Based Operation** Improve the synchronization of traffic flows at en-route merging points and to optimize the approach sequence through the use of 4DTRAD capability and airport applications, e.g. D-TAXI, via the air-ground exchange of aircraft derived data related to a single controlled time of arrival (CTA).		B3-TBO **Full 4D Trajectory-based Operations** Trajectory-based operations deploys an accurate four-dimensional trajectory that is shared among all of the aviation system users at the cores of the system. This provides consistent and up-to-date information system-wide which is integrated into decision support tools facilitating global ATM decision-making.

AFI Air Navigation System Implementation Action Plan

AFI AIR NAVIGATION SYSTEM IMPLEMENTATION ACTION PLAN

- **(APIRG/13)**
  - VHF Frequency Utilization Plan
  - Aeronautical Surveillance (Systems) Plan (App. P)
  - ATS Automation Systems Plan (App. Q)
  - AFI GNSS Strategy (App. R)
  - AFI CNS/ATM Implementation Plan (App. S)
  - Communication Plan
- **…….**

- **APIRG Conclusion 19/06**
  - Adoption of AFI Regional Air Navigation System Implementation Action Plan aligned with the ICAO Aviation System Block Upgrade (ASBU)



APIRG/19
APPENDIX 30A

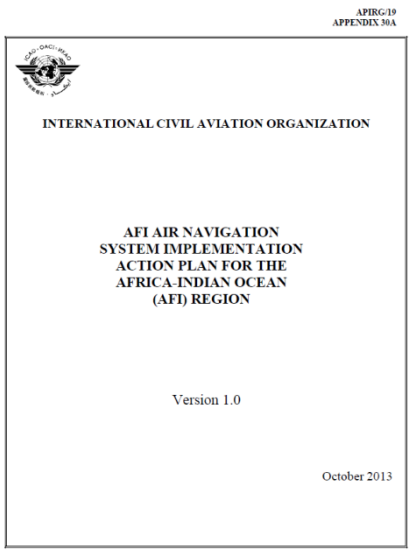
INTERNATIONAL CIVIL AVIATION ORGANIZATION

AFI AIR NAVIGATION
SYSTEM IMPLEMENTATION
ACTION PLAN FOR THE
AFRICA-INDIAN OCEAN
(AFI) REGION

Version 1.0

October 2013

- **AFI Air Navigation System Implementation Action Plan**
  - Categorization of ASBU Block0 Modules
  - Prioritization of ASBU Block 0 Modules
  - Air Navigation Report Forms (revised versio Performance Framework Form)



APIRG/19
APPENDIX 30A

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Version 1.0

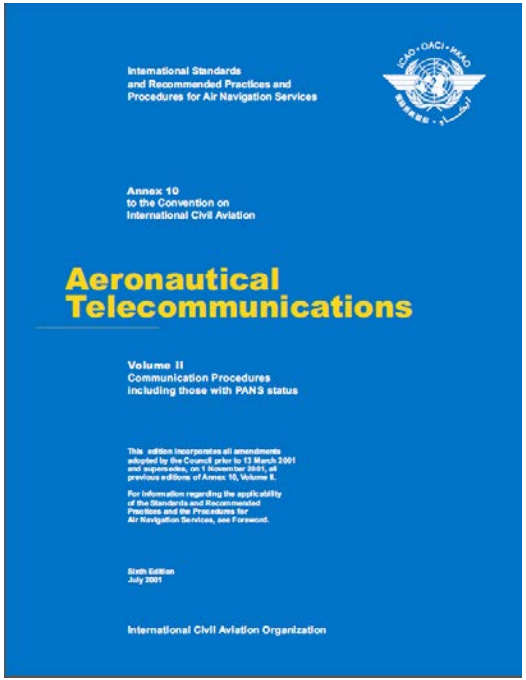
October 2013

ICAO SARPs, PANS and Manuals

Annex 10, Volume II

Chapter 8 Aeronautical Mobile Service – Data Link Communications

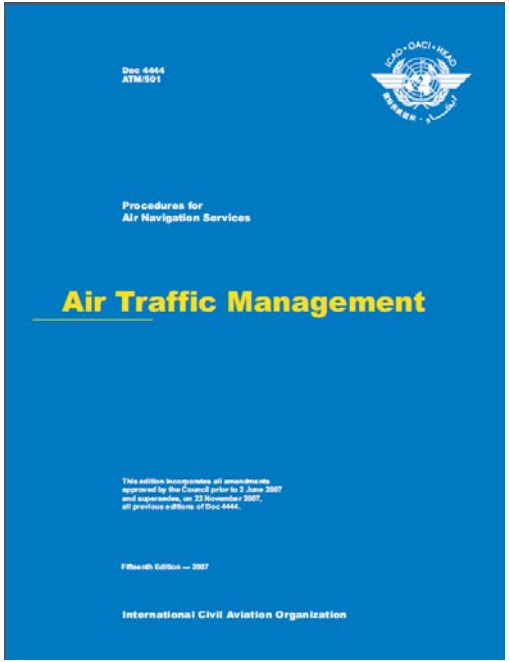
- Composition of data link messages
- Display of data link messages
- CPDLC procedures



PANS-ATM (Doc 4444)

Chapter 4 General Provisions for Air Traffic Services

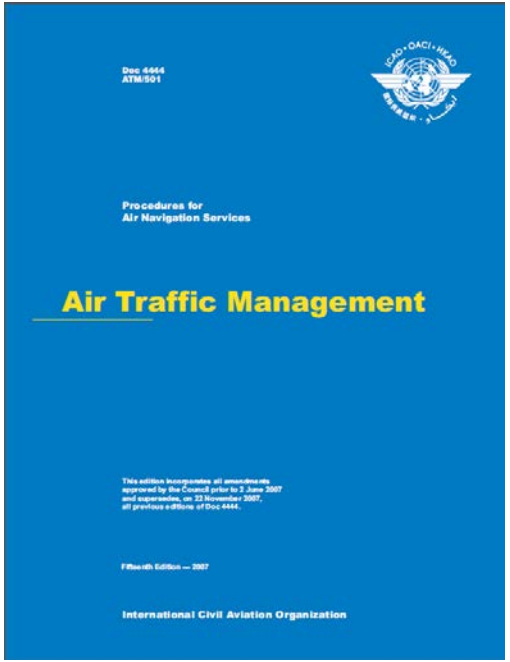
- 4.11 Position Reporting
  - 4.11.4 Transmission of ADS-C reports
  - 4.11.5 Contents of ADS-C reports
- 4.15 Data Link Communications initiation Procedures



PANS-ATM (Doc 4444)

Chapter 13 ADS-C Services

- ADS-C Ground system capabilities
- ADS-C related aeronautical information
- Use of ADS-C in the provision of ATC service
- Use of ADS-C in the application of separation minima

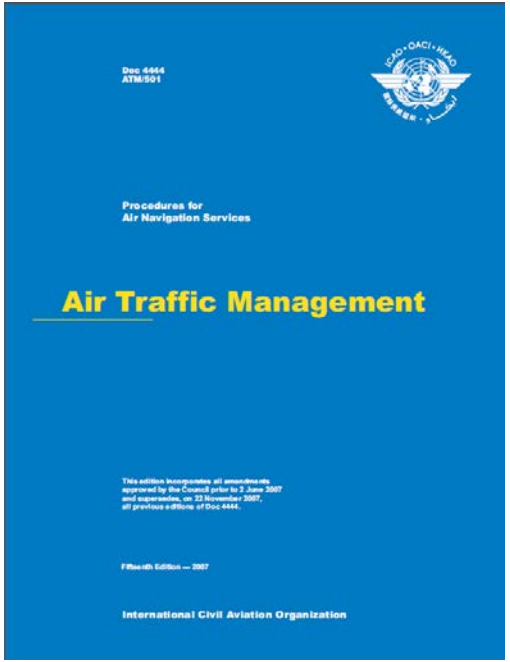


PANS-ATM (Doc 4444)

Chapter 14 CPDLC

- Establishment of CPDLC
- Exchange of operational CPDLC messages

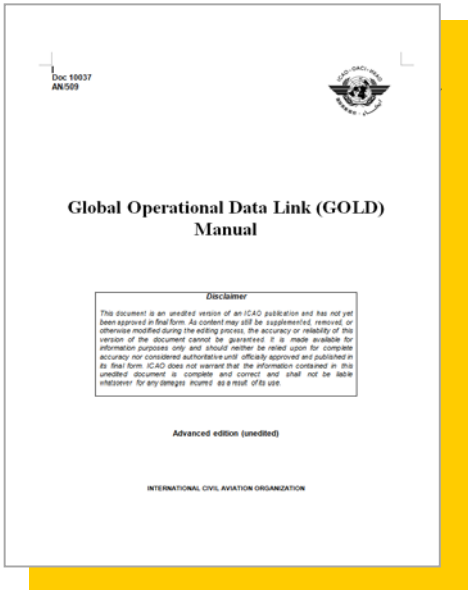
Appendix 1 Flight Plan, Item 10
Appendix 5 CPDLC Message Set



Proposed amendment to Annexes and PANS with an applicability date of Nov 2016

- Related to DLIC, ADS-C, CPDLC and PBCS
- State consultation for comments completed (State letter SP 52/4-15/44 refers)
- ANC final review is in progress

Global Operational Data Link (GOLD) Manual (Doc 10037, Edition 1)


Doc 10037
AN/509

Global Operational Data Link (GOLD) Manual

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Advanced edition (unedited)

INTERNATIONAL CIVIL AVIATION ORGANIZATION

- Supersedes regional GOLD V.2 dated 26 April 2013
- RCP/RSP specifications and post-implementation monitoring removed from regional GOLD and moved to PBCS Manual
- Additional changes made to ensure that No conflicts with provisions in Annex and PANS including and up to 2016 amendment
- To be published in July/August 2016

Global Operational Data Link Manual (Doc 10037, Edition 1)

Chapter 1. Overview of data link operations

Chapter 2. Administrative provisions related to data link operations

Chapter 3. Controller and radio operator procedures

Chapter 4. Flight crew procedures

Chapter 5. Advanced ATS supported by data link

Chapter 6. State aircraft data link operations

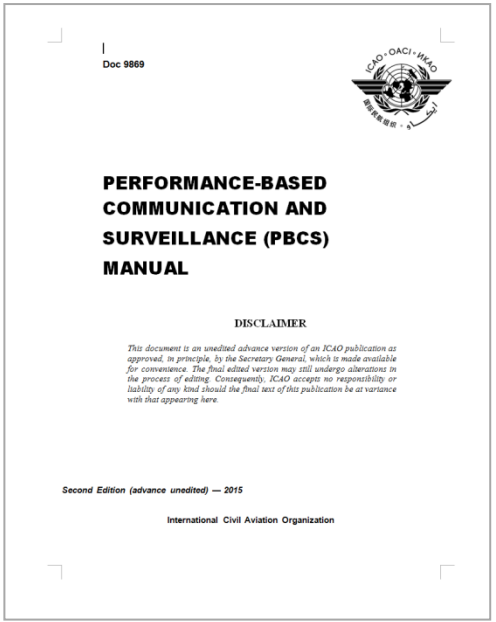
Appendix A CPDLC message elements and standardized free text message elements

Appendix B Regional/State specific information

Appendix C Operator/aircraft specific information

Performance-based Communication and Surveillance Manual (Doc 9869)

- **Developed based on the RCP Manual (Doc 9869), GOLD, SVGM and other regional material**
- **Expanded the scope to include:**
  - PBCS concept and surveillance capability
  - RCP and RSP specifications;
  - information and guidance provided from several workshops held in the regions; and
  - material from PIRG meetings and their contributory groups
- **To be published in July/August 2016**


Doc 9869

PERFORMANCE-BASED COMMUNICATION AND SURVEILLANCE (PBCS) MANUAL

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Second Edition (advance unedited) — 2015

International Civil Aviation Organization

Performance-based Communication and Surveillance Manual (Doc 9869)

Chapter 1. Definitions

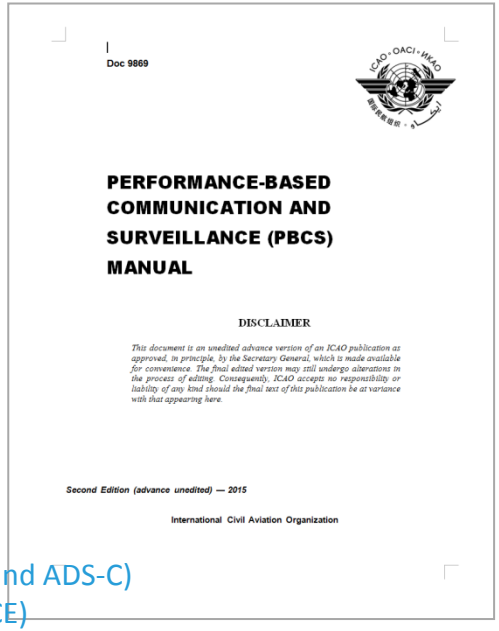
Chapter 2. PBCS concept

Chapter 3. Developing RCP/RSP specification

Chapter 4. Applying RCP/RSP specification

Chapter 5. Complying with RCP/RSP specification

Appendix A. PBCS implementation plan- checklist
Appendix B. RCP specifications
Appendix C. RSP specifications
Appendix D. Post-implementation monitoring and corrective action (CPDLC and ADS-C)
Appendix E. Post-implementation monitoring and corrective action (SATVOICE)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Doc 9869

PERFORMANCE-BASED COMMUNICATION AND SURVEILLANCE (PBCS) MANUAL

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Second Edition (advance unedited) — 2015

International Civil Aviation Organization

Questions?

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