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Advancing
Free Trade for Asia-Pacific
Prosperity

ICAO Updates

TPTWG45 – AEG, Agenda Item 5.4

Presented by

United States

Overview



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- **Background**
- **What drove the changes?**
- **New Guidance Material**
- **Q & A**

What drove all the changes?



- 1. ICAO Performance-based Communication and Surveillance (PBCS) implementation (29 March 2018)**
- 2. FAA domestic en route data communications implementation (May 2018 flight test / Oct 2018 IOC)**



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PBCS - why???

Operators have choices for their “data link”

Technology

- FANS 1/A
- ATN B1
- B2
- POA (VDLM0/A)
- AOA (VDLM2)
- HF DL
- SATCOM
 - Classic Aero on I3/I4
 - Data 2/Data 3
 - SwiftBroadband (SBB)
 - Short Burst Data (SBD)
 - Certus

Implementation

- AOC
- Cabin Services
- Configurable Avionics
- Procedures
- CSP/SSP
 - SITA
 - RC/ARINC
 - Inmarsat
 - Iridium
 - MTSAT



**Different
capabilities and
performance**

... and ATM operations, such as applying performance-based separation minima, rely on a specific data link capability

PBCS

ICAO PBCS Provisions – Effective 10 November 2016

Document ID	Description
Annex 6	Operation of Aircraft
Part I	Commercial Air Transport
Part II	General Aviation - Aeroplanes
Part III	Operations - Helicopters
Annex 11	Air Traffic Services
Annex 15	Aeronautical Information Services
Doc 4444	PANS – Air Traffic Management
Doc 8400	PANS – Abbreviations and Codes

Summary of ICAO PBCS Provisions



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In accordance with the ICAO PBCS Provision	In accordance with State policies	
	ANSP RESPONSIBILITY	OPERATOR RESPONSIBILITY
<p>STATE RESPONSIBILITY</p> <ul style="list-style-type: none"> <input type="checkbox"/> Establishes PBCS policies for ANSP, operator, airworthiness, etc. <input type="checkbox"/> Prescribes RCP/RSP specifications in the applicable airspace for the relevant operations <input type="checkbox"/> Publishes PBCS requirements in aeronautical information publication (AIP) 	<ul style="list-style-type: none"> <input type="checkbox"/> Provides RCP/RSP-compliant services <input type="checkbox"/> Recognizes RCP/RSP capabilities in air traffic control (ATC) automation <input type="checkbox"/> Establishes PBCS monitoring program 	<ul style="list-style-type: none"> <input type="checkbox"/> Files RCP/RSP capabilities in flight plan in accordance with State PBCS policy <input type="checkbox"/> Participates in ANSP PBCS monitoring programs



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ICAO PBCS Implementation

Implementation date: **29 March, 2018**

PBCS approval (RCP/RSP) required to be eligible to participate in the following horizontal separation minima in accordance with ICAO PANS-ATM (Doc 4444):

Dimension of separation	Separation Minima	RSP requirement	RCP requirement	Nav requirement
Lateral	42.6 km (23 NM)	180	240	RNP4
Performance-based Longitudinal	5 minutes	180	240	RNP2 RNP4 RNP10
Performance-based Longitudinal	55.5 km (30 NM)	180	240	RNP2 RNP4
Performance-based Longitudinal	93 km (50 NM)	180	240	RNP4 RNP10

Airspace using or planning to use one or more of the above

- PAC FIRs: Anchorage, Auckland, Brisbane, Fukuoka, Nadi, Oakland; Port Moresby, Santiago, Tahiti,
- NAT FIRs: Gander, Shanwick, Reykjavik, New York, Santa Maria
- Bay of Bengal routes: M300, N571, P570, P574; L301, L507, L510, L759, M770, N563, N877, N895, P628, P646 and P762
- South China Sea routes: N892, L625, N884, M767

Operational Authorization



Global requirements and guidance

Civil Aviation Authority (CAA) Requirements

- A CAA will need to have a PBCS policy based on the requirements of Annex 6 and guidance contained in Doc 9869. A PBCS operational authorization should be obtained from an assessment of the required elements in the operations manual (OM).
- However, this requirement does not preclude a State to issue a specific approval and document it in the Operations Specifications (Ops Spec), associated with the air operator certificate (AOC).

Operational Authorization



Global requirements and guidance

Manufacturer Requirements for Aircraft Eligibility

The aircraft manufacturer or equipment supplier should demonstrate that aircraft system meets the required communication performance (RCP)/required surveillance performance (RSP) specifications allocated to the aircraft system as contained in the PBCS Manual (Doc 9869).

Operational Authorization



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Global requirements and guidance

Operator Compliance

- Operator Training Program
- Operator Continued Monitoring
- Participation in the PBCS monitoring programs

Example: FANS 1/A Central Reporting Website (www.fans-cra.com)

This is a website created and administered by Airways New Zealand to facilitate coordination and cooperation concerning global data link operation including PBCS

- Flight Planning

Regional Implementation



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The Asia and the Pacific (APAC) and North Atlantic (NAT) Regions, which had applied 30NM lateral and 30/50 NM longitudinal separation minimum, agreed to transition to the implementation of these new requirements from **29 March 2018** in part of their airspace.

Regional Implementation



Excerpts from the APAC plan:

- States that apply or plan to apply 30 NM and/or 50 NM longitudinal separation minima and/or 30 NM or 23 NM lateral separation minimum minima are urged to implement the ATM system capability to process and use ICAO PBCS flight plan indicators to determine aircraft eligibility for performance-based horizontal separation by **not later than 29 March 2018**;
- States that apply or plan to apply performance-based separation minima requiring PBCS, aircraft operators and communication service providers (CSPs) are urged to sign up to the Global PBCS Charter, available on the FANS-CRA website at www.fans-cra.com.
- States applying performance-based horizontal separation minima, whether RNAV/RNP or PBCS based, should report their implementation status to the FANS-Interoperability Team – Asia (FIT-Asia) at least once annually, and upon any change of implementation status



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FAA Implementation

FAA data comm guidance material

- AC 90-117
 - 3 Oct 2017 (published)
 - Supersedes AC 120-70C
- Data Link Communications (A056) Compliance Guide (v12.17)
 - 24 Oct 2017 (original version posted on AFS-470 data comm web page)
 - Supersedes Draft A056 job aid
 - https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afx/afs/afs400/afs470/datacomm/
- N8900.455
 - March 12 2018 (published)
 - Includes new A056 templates
 - 29 March 2018 – A056 mandatory revision date

Resources



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ICAO Web site:

[https://www.icao.int/airnavigation/
pbcs/Pages/default.aspx](https://www.icao.int/airnavigation/pbcs/Pages/default.aspx)

Resources



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International Civil Aviation Organization

- Annex 6 — *Operation of Aircraft*
- Annex 11 — *Air Traffic Services*
- *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444)
- *Global Operational Data Link (GOLD) Manual* (Doc 10037)
- *Performance-based Communication and Surveillance (PBCS) Manual* (Doc 9869)
- Operational Authorization Guide, PBCS, by the Operational Data Link Specific Working Group of the Communications Panel

RTCA/EUROCAE

- Safety and Performance Standard for Air Traffic Data Link Services in Oceanic and Remote Airspace (Oceanic SPR Standard, RTCA DO-306/EUROCAE ED-122)
- Interoperability Requirements for ATS Applications Using ARINC 622 Data Communications (RTCA DO-258A/EUROCAE ED-100A)
- Future Air Navigation System 1/A — Aeronautical Telecommunication Network Interoperability Standard (RTCA DO 305A/EUROCAE ED 154A)

State documents

- Federal Aviation Administration (FAA) Advisory Circular (AC) 90-117 – Data Link Communications
- United Kingdom (UK) Aeronautical Information Circular Y 094/2017 – Introduction of PBCS in the ICAO North Atlantic Region
- Transport Canada (TC) Advisory Circular 700-041 – Special Authorization (SA) for Required Communications Performance (RCP) 240 and Required Surveillance Performance (RSP) 180

Supporting Guidance Material

Document ID	Description
Doc 9869	Performance-based Communications and Surveillance (PBCS) manual, Edition 2
Doc 10037	Global Operational Data Link (GOLD) Manual, Edition 1
Doc 10063	Manual on Monitoring the Application of Performance-based Horizontal Separation Minima, Edition 1

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PBCS Vs PBN



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The PBCS concept is aligned with that of performance-based navigation (PBN). While the PBN concept applies required navigation performance (RNP) and area navigation (RNAV) specifications to the navigation element, the PBCS concept applies required communication performance (RCP) and required surveillance performance (RSP) specifications to communication and surveillance elements, respectively. However, there are some differences between the PBCS and PBN concepts:

- a) the PBCS concept applies RCP and RSP specifications, which allocate criteria to ATS provision, including communication services, aircraft capability, and the aircraft operator; whereas the PBN concept applies RNP/RNAV specifications, which allocate criteria only to the aircraft capability and the aircraft operator; and
- b) the PBCS concept includes post-implementation monitoring programmes, on a local and regional basis, with global exchange of information; whereas the PBN concept includes real time monitoring and alerting functionality in the aircraft capability.