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Singapore****AIP SUP  
007/2018****Effective from 29 MAR 2018****PERM****Published on 01 FEB 2018****SINGAPORE FIR – IMPLEMENTATION OF PERFORMANCE-BASED  
COMMUNICATION AND SURVEILLANCE (PBCS)****1 INTRODUCTION**

1.1 This AIP Supplement informs aircraft operators on the implementation of Performance-Based Communication and Surveillance (PBCS) within Singapore FIR in accordance with the ICAO provisions to support Performance-Based reduced horizontal separation minima application using data link **with effect from 29 March 2018 0000UTC**.

1.2 PBCS is a concept that enables the management of communication and surveillance capabilities by prescription of Required Communication Performance (RCP) and Required Surveillance Performance (RSP) specifications in Future Air Navigation System (FANS 1/A) data link operations using the Automatic Dependent Surveillance-Contract (ADS-C) and Controller Pilot Data-link Communications (CPDLC).

1.3 Pursuant to the ICAO Provisions and amendments to Annexes 4, 6 (Parts I, II, III), 10 (Volumes II, III), 11, 15, PANS-ATM (Doc 4444) and PANS-ABC (Doc 8400) on PBCS, including new Standards and Recommended Practices (SARPS) and related guidance material, Performance-Based Communication and Surveillance (PBCS) Manual (Doc 9869 2<sup>nd</sup> Edition) and Global Operational Data Link (GOLD) Manual (Doc 10037 1<sup>st</sup> Edition), are applicable from 10 November 2016.

1.4 Recognizing that many States, Air Navigation Service Providers (ANSPs) and aircraft operators will not be ready to fully implement the new PBCS provisions by 10 November 2016, the 27<sup>th</sup> Meeting of the ICAO Asia Pacific Air Navigation Planning and Implementation Regional Group endorsed the decision to implement PBCS particularly on the use of ICAO PBCS flight plan indicators to determine aircraft eligibility for performance-based separation not later than 29 March 2018.

**2 PBCS FRAMEWORK**

2.1 The PBCS concept provides a framework to apply RCP and RSP specifications to ensure the acceptable communication and surveillance capabilities and performance of an operational system.

2.2 The main components that involve the joint participation from States, ANSPs and aircraft operators under the PBCS implementation framework consist of the following:

- a. To prescribe RCP and RSP specifications, for aircraft operators, aircraft systems and infrastructure supporting datalink operations, when applying separations predicated on such performance;
- b. Operational approval of aircraft operators for a communication and / or surveillance capability including aircraft equipage for operations where RCP and / or RSP specifications will have to be prescribed;
- c. Indication of an aircraft's communication and performance capability in the form of RCP / RSP specifications in the flight plan; and
- d. Monitoring programmes to assess actual communication and surveillance performance against RCP and RSP specifications and to determine corrective action to report, analyse and resolve problems.

### 3 OPERATOR AND AIRCRAFT SYSTEMS

3.1 Operator should continue to use CPDLC and ADS-C in accordance with policies established by the State of Registry or State of the Operator.

3.2 Operator obtaining approval in accordance with National regulations (State of the Operator or State of Registry) should ensure that the procedures, system and services in operations and maintenance programs meet the allocated criteria in interoperability standards and RCP / RSP specifications.

3.3 Establish the necessary training and qualification programs for flight crews and flight operations officers / dispatchers in preparation for PBCS implementation that is consistent with ICAO Annex 1 and Annex 6.

3.4 Initial compliance to the PBCS requirements would be beneficial to establish the confidence that Air Traffic Management (ATM) operations could be provided only to eligible aircraft. The PBCS concept will enhance the safety on Performance-Based reduced horizontal separation minima application using data link in Air Traffic Service (ATS) operations.

### 4 SEPARATION MINIMA

4.1 A Performance-Based Longitudinal Separation minima of 50NM may be applied between RNP10 approved aircraft on ATS routes L642, M635, M767, M771, M774 and N884 which either LOGON to CPDLC or are within VHF radio range as the primary means of communication. Such direct controller-pilot communication (DCPC) shall be maintained at all times when applying these separation minima.

4.2 RCP240 and RSP180 performance specifications shall be required for the application of the Performance-Based Longitudinal Separation minima in accordance with PANS-ATM (Doc 4444) paragraph 5.4.2.9.2.

4.3 Otherwise, 80NM RNAV or 10 minutes (or less) Mach Number Technique (MNT) separation minima may be applied between aircraft in situation where DCPC could not be maintained or when RCP240 / RSP180 performance requirement could not be complied.

### 5 FLIGHT PLAN REQUIREMENTS

5.1 Existing requirement for aircraft using data link communications to annotate their ICAO flight plan according to AIP Singapore page ENR 1.1-15 paragraph 8.7.1 remain unchanged.

5.2 Operators conducting flights in airspace where separations are dependent on PBCS should start using RCP / RSP indicators in the flight plan as soon as possible (not later than 29 March 2018) and to adhere to the provisions stated in Appendix 2 of PANS-ATM (Doc 4444).

5.3 Aircraft planning to utilise data link communications must annotate their ICAO flight plan as follows:

- i. Data link communication serviceability and capability must be notified by inserting one or more of the following letters in Item 10a (radio communication, navigation and approach aid equipment and capabilities):

J1	CPDLC ATN VDL Mode 2
J2	CPDLC FANS 1/A HF DL
J3	CPDLC FANS 1/A VDL Mode A
J4	CPDLC FANS 1/A VDL Mode 2
J5	CPDLC FANS 1/A SATCOM (INMARSAT)
J6	CPDLC FANS 1/A SATCOM (MTSAT)
J7	CPDLC FANS 1/A SATCOM (Iridium)
P1	CPDLC RCP 400
P2	CPDLC RCP 240
P3	SATVOICE RCP 400
P4-P9	Reserved for RCP

- ii. Aircraft registration must be inserted in Item 18 as the ground system uses the information during the AFN LOGON.

- iii. Serviceable ADS-C equipment carried must be annotated on the flight plan by adding one or more of the following descriptors to describe the serviceable surveillance equipment and/or capabilities on board:

D1	ADS-C with FANS 1/A capabilities
G1	ADS-C with ATN capabilities

- iv. Additional surveillance equipment or capabilities are to be listed in Item 18 following the indicator SUR/ .

5.4 Guidance material on the application of performance-based communication and performance-based surveillance, which prescribes RCP / RSP to an air traffic service in a specific area, is contained in the Performance-Based Communication and Surveillance (PBCS) Manual (Doc 9869 2<sup>nd</sup> Edition).

## **6 Cancellation**

6.1 This AIP supplement will be cancelled when the contents are incorporated into AIP Singapore.

## **7 CONSULTATIONS**

7.1 Please email [KWEK\\_Chin\\_Lin@caas.gov.sg](mailto:KWEK_Chin_Lin@caas.gov.sg) if you have any queries regarding this matter.

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