



EMA/RMA Role in PBCS Monitoring

Global Operational Data Link (GOLD)

Familiarization with Performance Based Communications
and Surveillance (PBCS) Workshop

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Summary

- This presentation summarized a paper presented by NAARMO at the RVSM RMACG 12 in May 2017
- Contents:
- PBCS Implementation
- NAT PBCS Information Sharing Project Team (NAT PBCS IS PT) Recommendation
- RMA Activities Needed to Distribute PBCS Approval Records
- RMA Activities Needed to Distribute PBCS Monitoring Results
- RMA Coordination Group /12 Meeting Action
- NAT SPG53 Outcome

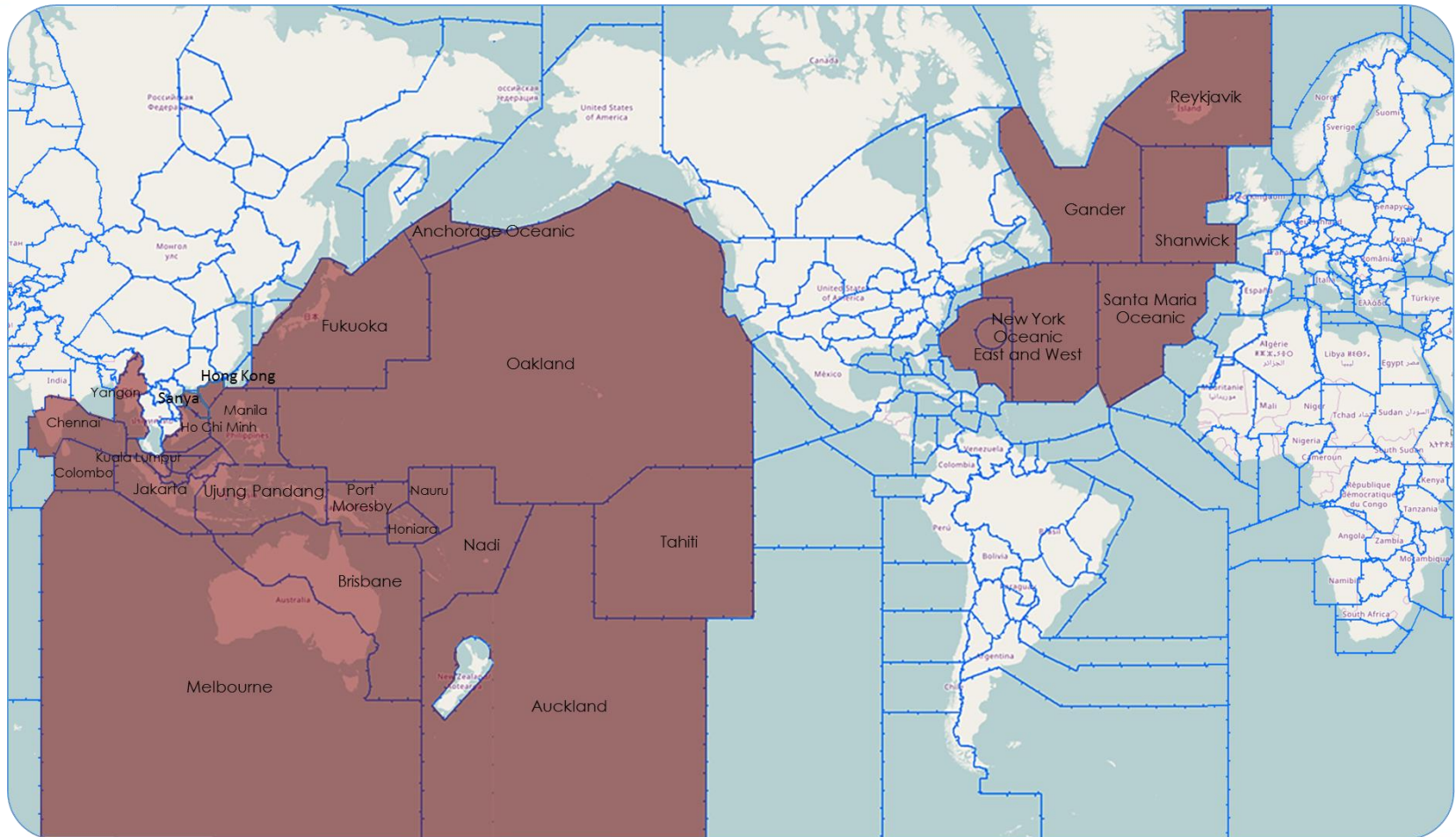
PBCS Concept

- The PBCS concept provides objective operational criteria to evaluate different and emerging communication and surveillance technologies, intended for evolving air traffic management (ATM) operations.
- The PBCS concept is aligned with that of performance based navigation (PBN).
- PBCS concept applies required communication performance (RCP) and required surveillance performance (RSP) specifications to communication and surveillance elements, respectively.

PBCS Implementation Areas

- It was agreed by the North Atlantic and Asia Pacific Regional Planning and Implementation Groups (PIRGs) that PBCS would be implemented in areas where reduced oceanic separation standards are applied
- The expected benefit is promotion of global harmonization and a performance-based approach to implementations that use existing and/or emerging technologies to provide enhanced communication and surveillance capabilities, while ensuring the acceptable level of safety
- Application of PBCS will be limited to airspaces where the separation standards are or are intended to be applied

FIRs Using/Planning Separation Minima Requiring PBCS Approval



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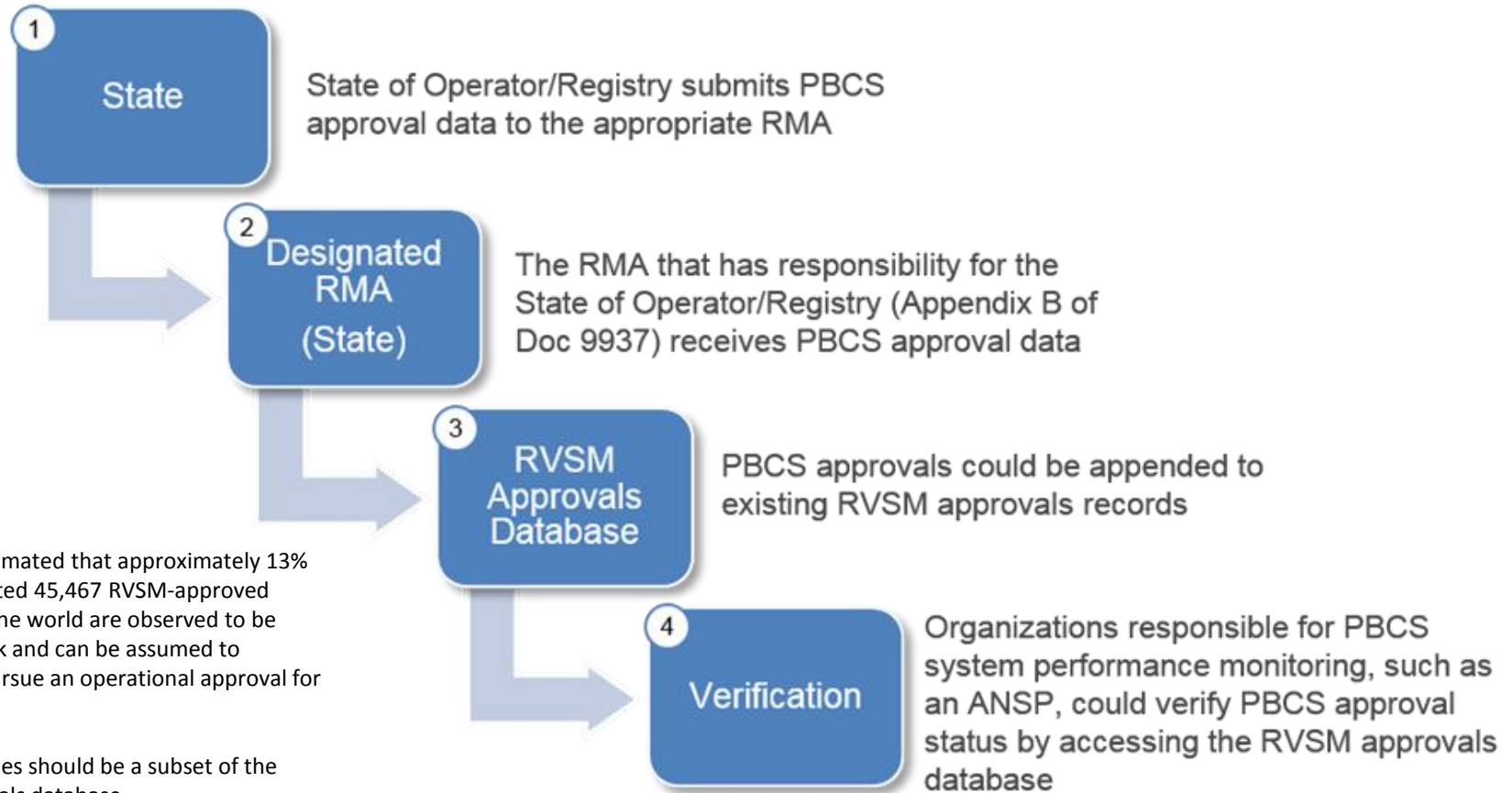
State PBCS Policies

- There is a need for PBCS State policies to be in place to issue operational RCP/RSP approvals for those operators desiring to take advantage of the applicable performance-based separation standards.
 - ✦ Currently, there are four known policies in draft or final form from Canada, the United States, the United Kingdom and New Zealand.
- In order to identify the States with the largest number of potential RCP/RSP approvals, an analysis was conducted utilizing the following data sources:
 - ✦ Global database of aircraft having RVSM approvals as of March 2017 – compiled from data regularly shared between the RMAs;
 - ✦ List of airframes observed to be using data link (ADS-C and CPDLC) within:
 - the NAT during July to December 2016
 - the New York, Oakland and Anchorage FIRs during January 2016 to April 2017;
 - the Auckland FIR during January March 2017
 - ✦ List of airframes observed to be filing RNP4 within the New York, Oakland and Anchorage FIRs during January 2016 to April 2017.

NAT PBCS IS PT Recommendation

- The NAT Safety Oversight Group (SOG) and Implementation Management Group (IMG) agreed to create the NAT PBCS Information Sharing Project Team (NAT PBCS IS PT)
 - ✦ to “develop proposals on potential mechanisms to enable providing the relevant information (e.g. PBCS results showing non-conformity and/or corrective action) from its source (e.g. ANSP) to the State of the Operator or Registry and NAT airspace users to RMAs outside NAT Region”.
- The NAT CMA (and other Regional Monitoring Agencies) are experienced in the monitoring of Approvals and Performance, and are well-placed to adapt their established procedures and networks to meet the expanded requirements of PBCS, subject to agreement as to scope of the task between RMAs.

NAT PBCS IS PT Proposed method of submitting and receiving PBCS approvals data



Note: It is estimated that approximately 13% of the estimated 45,467 RVSM-approved airframes in the world are observed to be using data link and can be assumed to potentially pursue an operational approval for RCP/RSP.

These airframes should be a subset of the RVSM approvals database.

Reports of Insufficient PBCS Performance

- The PBCS monitoring program requires continuous performance monitoring of data link operations
- According to section 4.5.2 of the PBCS Manual, the ANSP:
 - ✦ “should perform an analysis of actual communication performance (ACP) and actual surveillance performance (ASP) at an interval suitable to verify system performance, and
 - ✦ “enable continuous performance improvement by detecting where specific infrastructure, aircraft operator fleet, aircraft type, or individual aircraft is not meeting the RCP/RSP specification,”
 - ✦ “report to the regional PBCS monitoring programme any problems that may have a regional or global impact, or affect aircraft operators in its airspace, including any non-compliance with an RCP/RSP specification.”
- Further, it is required that the States of the operator/registry are notified of aircraft/fleets observed with non-compliant data link performance and take corrective action.

Potential Non-compliance Reports by Fleet for States/RMAs

RMA	State	Count of under-performing oper/act pairs
ARMA	ETHIOPIA	1
ARMA	SOUTH AFRICA	1
ARMA TOTAL		2
CMA	NORWAY	1
CMA TOTAL		1
EUR RMA	AZERBAIJAN	1
EUR RMA	DENMARK	1
EUR RMA	FINLAND	1
EUR RMA	FRANCE	2
EUR RMA	GERMANY	3
EUR RMA	ITALY	2
EUR RMA	LUXEMBOURG	2
EUR RMA	POLAND	1
EUR RMA	SPAIN	2
EUR RMA	SWEDEN	2
EUR RMA	SWITZERLAND	1
EUR RMA	UNITED KINGDOM	5
EUR RMA TOTAL		23
MAAR	VIET NAM	1
MAAR TOTAL		1
MID RMA	QATAR	2
MID RMA	SAUDI ARABIA	1
MID RMA	UNITED ARAB EMIRATES	1
MID RMA TOTAL		4
NAARMO	CANADA	5
NAARMO	UNITED STATES	19
NAARMO TOTAL		24
RMA EURASIA	RUSSIAN FEDERATION	2
RMA EURASIA TOTAL		2
GRAND TOTAL		57

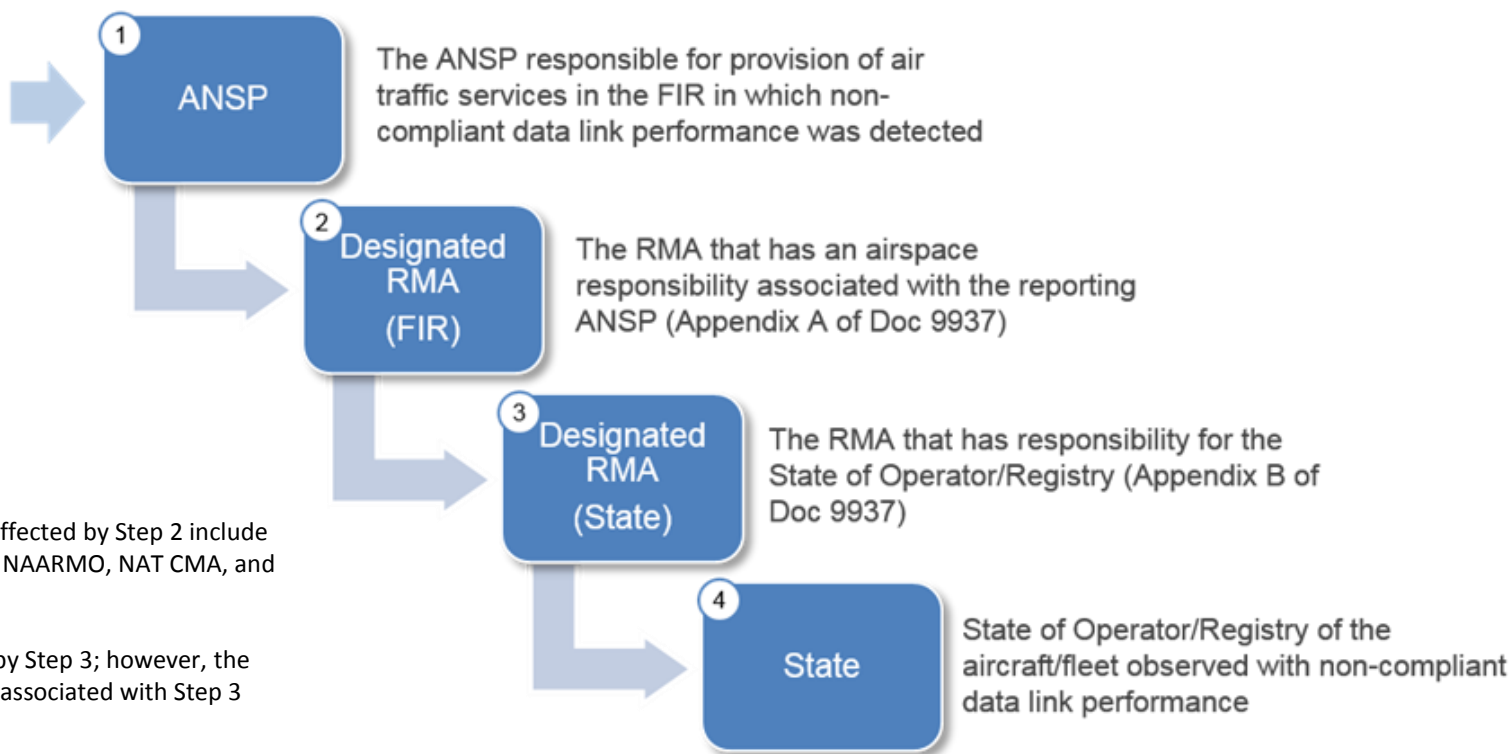


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Communication flow for reports of non-compliance with PBCS performance requirements

ICAO SARPS



Note: The only RMAs affected by Step 2 include AAMA, JASMA, MAAR, NAARMO, NAT CMA, and PARMO

All RMAs are affected by Step 3; however, the scope of the workload associated with Step 3 should be minimal.

Designated RMAs and ANSPs by FIR

FIR	Region	ANSP	Designated RMA
Anchorage Oceanic	Asia Pacific	Federal Aviation Administration (FAA)	PARMO
Auckland	Asia Pacific	Airways New Zealand	PARMO
Brisbane	Asia Pacific	Airservices Australia	AAMA
Chennai	Asia Pacific		MAAR
Colombo	Asia Pacific		MAAR
Fukuoka	Asia Pacific	Japan Civil Aviation Bureau (JCAB)	JASMA
Ho Chi Minh	Asia Pacific	Vietnam Air Traffic Management Corporation (VATM)	MAAR
Hong Kong	Asia Pacific	Hong Kong Civil Aviation Department (HKCAD)	MAAR
Honiara	Asia Pacific	Airservices Australia	AAMA
Jakarta	Asia Pacific	AirNav Indonesia	AAMA
Kota Kinabalu	Asia Pacific		MAAR
Kuala Lumpur	Asia Pacific	Department of Civil Aviation Malaysia	MAAR
Manila	Asia Pacific	Civil Aviation Authority of the Philippines (CAAP)	MAAR
Melbourne	Asia Pacific	Airservices Australia	AAMA
Nadi	Asia Pacific	Airports Fiji Limited	PARMO
Nauru	Asia Pacific	Airservices Australia	AAMA
Oakland	Asia Pacific	Federal Aviation Administration (FAA)	PARMO
Port Moresby	Asia Pacific	PNG Air Services	AAMA
Sanya	Asia Pacific		MAAR
Singapore	Asia Pacific	Civil Aviation Authority of Singapore (CAAS)	MAAR
Tahiti	Asia Pacific		PARMO
Ujung Pandang	Asia Pacific	AirNav Indonesia	AAMA
Yangon	Asia Pacific	Department of Civil Aviation (DCA) Myanmar	MAAR
Gander	North Atlantic	NAV Canada	NAT CMA
New York Oceanic East	North Atlantic	UK NATS	NAARMO
New York Oceanic West	North Atlantic	FAA	NAARMO
Reykjavik	North Atlantic	Isavia Ltd	NAT CMA
Santa Maria Oceanic	North Atlantic	NAV Portugal (Navegação Aérea de Portugal)	NAT CMA
Shanwick	North Atlantic	UK NATS	NAT CMA

Scope of RMA Support

- A data analysis was conducted to determine how many non-compliance reports could potentially be circulated prior to or following the implementation of PBCS
- PBCS monitoring results for the period from July to December 2016 were compiled from seven flight information regions:
 - ✦ New York, Reykjavik, Santa Maria and Shanwick from the NAT region (NAT Data Link Performance Report 2016); and Anchorage, Auckland and Oakland from the Pacific region.
- The fleets (operator/aircraft type pair) and airframes that were identified as not meeting the 95% performance requirements associated with RSP180 and RCP240 were assembled and organized to provide estimates of potential non-compliance that would be circulated to respective States of Operator/Registry via corresponding RMAs.

RMA Paper Conclusion

- In support of continued safe operations within airspaces for which RMAs are currently performing system performance monitoring in the vertical dimension, RMAs could play a valuable role in supporting safe operations in the horizontal plane in airspace where PBCS is applied by accommodating PBCS approval data and serving as a liaison between ANSPs and relevant States.
- It is proposed that the RMAs support the regional PBCS monitoring programs by:
 - ✦ Receiving reports of non-compliance with RSP180 and RCP240 from ANSPs associated with current airspace responsibility and transmitting reports to the respective State;
 - ✦ Receiving and maintaining RCP and RSP approvals issued by States of Operator/Registry associated with current State responsibility and incorporating into expanded RVSM/PBCS approvals database; and
 - ✦ Sharing RCP and RSP approvals between RMAs in line with current sharing practices of RVSM approvals for the ability of States/ANSPs to verify that aircraft operators filing PBCS capabilities in the flight plan are authorized to do so.
- It is further proposed that the expanded role of RMAs be coordinated by the relevant PIRGs at the upcoming 2017 meetings and RMA terms of reference be updated accordingly.

RMACG Report Conclusion

- The paper proposes an extension of the duties and responsibilities of the RMAs in supporting safe operations in the horizontal plane in airspace where PBCS is applied by accommodating PBCS approval data and serving as a liaison between ANSPs and relevant States.
- The meeting discussed on the possible increase in the workload of RMAs with the proposed expansion of their roles and also possible overlap with work already ongoing for other agencies or groups monitoring CPDLC communications.
- The meeting agreed that NAARMO would take the lead on coordinate with the ICAO CP-OPDLWG on potential updates to the ICAO Doc 9896 and ICAO Doc 9937 to reflect expanded role of RMAs in support of regional PBCS monitoring programs.

NAT SPG53 Outcome

- That the ICAO Regional Director, Europe and North Atlantic, take appropriate actions to ,
- a) Amend the terms of reference for the NAT CMA to include the following;
 - i) receive reports of non-compliance with RSP180 and RCP240 from NAT ANSPs and transmitting reports to the respective RMA associated with the State of the respective operator/aircraft;
 - ii) receive and maintain RCP and RSP approvals issued by States of Operator/Registry associated with current State responsibility and incorporating into expanded RVSM/PBCS approvals database and follow-up as appropriate instances of non-approved aircraft being identified in PBCS airspace. This would be determined by augmenting the existing monthly RVSM approvals check to incorporate a similar check against PBCS Approvals where these have been included in the flight plan but no approvals record is held by RMAs;
 - iii) sharing RCP and RSP approvals between RMAs in line with current sharing practices of RVSM approvals for the ability of States/ANSPs to verify that aircraft operators filing PBCS capabilities in the flight plan are authorized to do so.
- b) Prepare, coordinate and submit proposals for amendment to the ToRs of other RMAs to include the same elements as in a) above, through appropriate PIRGs and ICAO Regional Offices