Making safe operations safer

Theresa Brewer and Vince McMenamy, FAA, and Paul Radford, Airways New Zealand, explain ICAO performance-based communication and surveillance requirements that must be implemented by 29 March 2018.

What is performance-based communication and surveillance?

The ICAO performance-based communication and surveillance (PBCS) framework ensures that emerging technologies for communication and surveillance fully support ATM operations and are implemented and operated safely.

Why is it important?

Part of the framework is performance-based separation minima. This allows aircraft to be separated safely according to technological capability rather than "one-size-fits-all" prescriptive distances. New requirements for performance-based separation minima under the PBCS framework were originally due to come into force in November 2016 but ICAO then extended the deadline to 29 March 2018.

The new requirements for the provision of performance-based separation minima are detailed in ICAO Annexes 6 (on operation of aircraft) and 11 (on air traffic services), as well as in PANS-ATM (Procedures for Air Navigation Services – Air traffic Management).

ICAO has allowed the extra time to ensure compliance with ICAO's required communication performance (RCP) specification 240 (RCP240) and required surveillance performance (RSP) specification 180 (RSP180). RCP details the communication performance and RSP defines the surveillance performance necessary for a particular operation or service.

Accommodating PBCS

Performance-based separation minima used in some oceanic airspace is covered under the performance-based communication and surveillance (PBCS) framework. So, the key for ANSPs applying these separations is to meet the March deadline for implementing PBCS.

The State regulator will need to determine which policies under its jurisdiction need to be revised to accommodate PBCS. States are
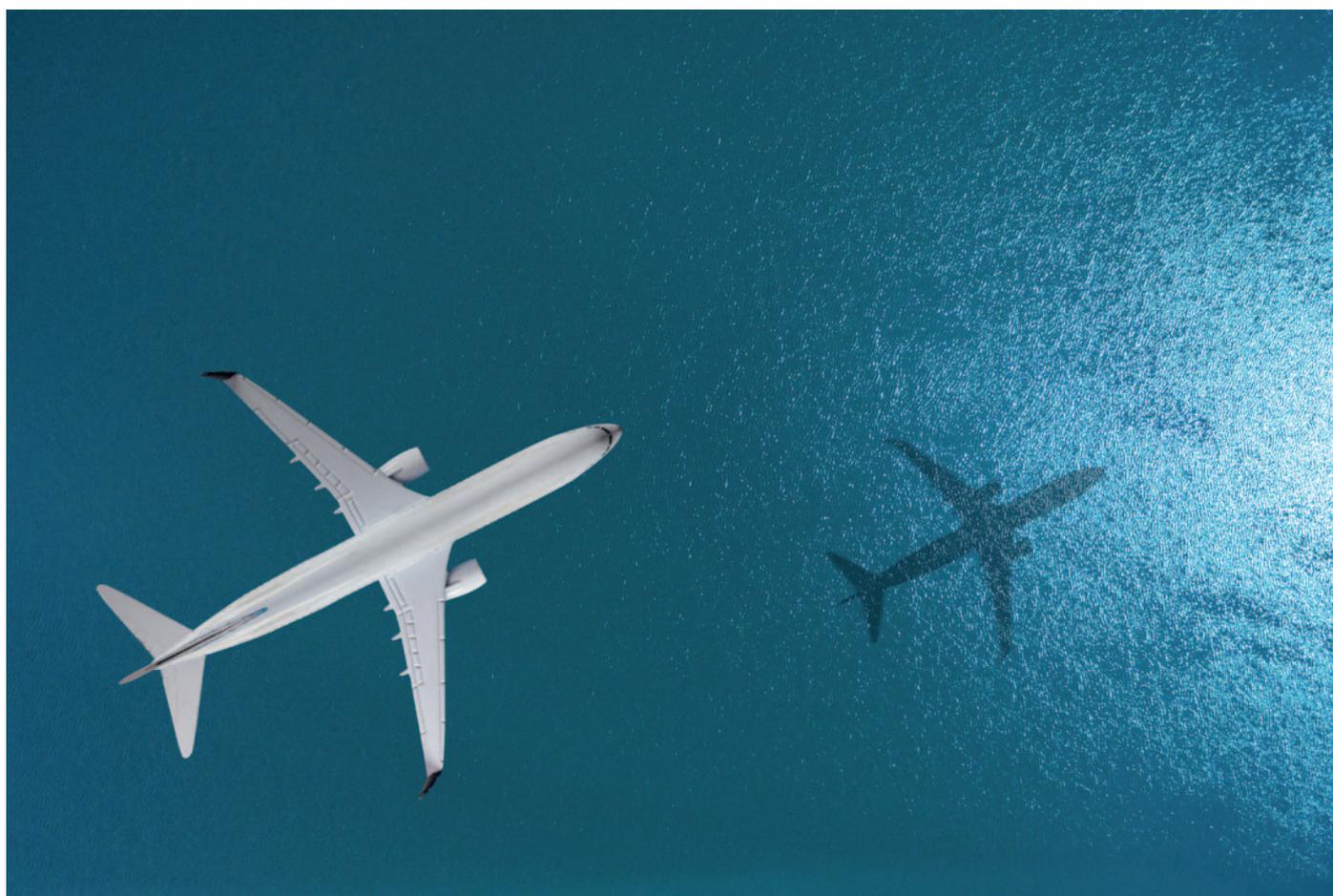
An essential aspect of the PBCS framework involves post-implementation monitoring for continued safe operations in remote and oceanic airspaces.

Credit: iStock/Naypong

High-level summary of the responsibilities of the State, ANSP and Operator		
In accordance with the ICAO PBCS Provision	In accordance with State policies	
State responsibility	ANSP responsibility	Operator responsibility
✈ Establishes PBCS policies for ANSP, operator, airworthiness, etc. ✈ Prescribes RCP/RSP specifications in the applicable airspace for the relevant operations. ✈ Publishes PBCS requirements in aeronautical information publication (AIP)	✈ Provides RCP/RSP-compliant services ✈ Recognises RCP/RSP capabilities in air traffic control (ATC) automation ✈ Establishes PBCS monitoring program	✈ Prepares to file RCP/RSP capabilities in flight plan ✈ Participates in ANSP PBCS monitoring programs

Source: FAA/NextGen

responsible for establishing an approval process for their operators that are utilising data link and would like to be eligible to use performance-based separation in any available airspace.

This process will outline the procedures for operators to obtain the authorisations that substantiate compliance with all of the applicable requirements and allow them to file the RCP240/RSP180 codes in their flight plans.

Examples of this type of policy document include the Federal Aviation Administration's advisory circular AC 90-117, Data Link Communications, Transport Canada's advisory circular AC 700-041, Special Authorization (SA) for Required Communications Performance (RCP) 240 and Required Surveillance Performance (RSP) 180 and the UK Civil Aviation Authority's advisory circular, Y094/2017.

Furthermore, if a State has responsibility over an ANSP that intends to continue applying or begin applying performance-based separation minima, it will be required to establish policies for the prescription of the RCP240/RSP180 specifications and ensure the ANSP complies with all the necessary requirements.

How to plan

For a smooth transition to PBCS operations, an ANSP needs to develop, in concert with its regulator, operators, and any other stakeholders, an implementation plan in accordance with ICAO requirements.

The plan will cover policy and procedures for air traffic controllers, changes to air traffic service automation, development of a monitoring mechanism and a strategy to increase PBCS awareness with all stakeholders.

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These authorisations include aircraft manufacturer certification that the relevant safety and performance requirements are met by the aircraft system; verifying that an operator meets its allocated requirements, including PBCS training for its staff; and a contract/service level agreement with its communication service provider that details expected network performance.

The CSP is a vital stakeholder in the provision of performance-based separation minima, which are dependent on data link. The CSP should coordinate with its ANSP and operator customers to ensure that its system is capable of providing the service that is needed to achieve RCP240 and RSP180.

The ANSP and operator in turn should ensure the means to enforce the applicable requirements, including system latency, availability and outage notification.

An essential aspect of the PBCS framework involves post-implementation monitoring for continued safe operations in remote and oceanic airspaces.

This includes end-to-end monitoring of the performance of automatic dependent surveillance – contract (ADS-C) and Controller/Pilot Data Link Communication against RCP and RSP requirements at an airspace and operator level.

The monitoring of system availability and a robust problem reporting, investigation and resolution mechanism to support continuous system improvement and hazard mitigation are equally vital. ✈