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UK Aeronautical Information Services

NATS Swanwick

Room 3115,

Sopwith Way

Southampton SO31 7AY

aissupervisor@nats.co.uk

<http://www.ais.org.uk>

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INTRODUCTION OF PERFORMANCE BASED COMMUNICATION AND SURVEILLANCE (PBCS) IN THE ICAO NORTH ATLANTIC REGION

1 Introduction

- 1.1 Advances in aircraft avionics and air traffic management flight data processing systems resulted in an initiative to analyse whether the lateral separation standard in the current North Atlantic High Level Airspace (NAT HLA) could be reduced from 60 nm to 25 nm thereby increasing the number of route options available and capacity at optimum flight levels. An ongoing trial implementation of 25 nm lateral separation, referred to as Reduced Lateral Separation Minimum (RLatSM), has established tracks that are spaced by one-half degree of latitude with the inclusion of an extra track between the core tracks of the NAT Organised Track System (OTS) from Flight Level (FL) 350 to FL 390 inclusive. Phase 2 will extend the trial to the whole of the OTS and is planned to commence by the end of 2017. A similar trial has been ongoing in the Shanwick Oceanic Control Area (OCA) to reduce longitudinal separation to 5 minutes between aircraft following the same track. This initiative is referred to as Reduced Longitudinal Separation Minimum (RLongSM). These trials will be terminated on 29 March 2018. However, the formal introduction of ICAO Performance Based Communication and Surveillance (PBCS) standards in the NAT HLA on 29 March 2018 will continue to allow the application of both reduced lateral and longitudinal separation after this date for aircraft that meet the Required Communication Performance (RCP) and Required Surveillance Performance (RSP) specifications. This AIC sets out the criteria for PBCS and the requirements for operators to continue using airspace where PBCS separations (ie reduced separations) are being applied.
- 1.2 This AIC applies to aircraft operators holding a UK Air Operators Certificate and UK private aircraft operators that wish to benefit from PBCS derived separations.

2 Performance Based Communication and Surveillance (PBCS)

- 2.1 The air traffic management (ATM) application of reduced separation minima is predicated on specific communication and surveillance capabilities, namely Required Communication Performance (RCP) and Required Surveillance Performance (RSP). The RCP and RSP specifications are a set of requirements for air traffic service provision, associated ground equipment, aircraft capability and operations needed to support PBCS. These include performance requirements that are allocated to system components in terms of the communication and surveillance to be provided and associated data, delivery time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace design.
- 2.2 Performance-based operations and monitoring have been implemented in the NAT HLA to ensure the ongoing safety and efficiency of ATM operations. The performance of FANS 1/A (and equivalent), Controller-Pilot Data Link communications (CPDLC) and Automatic Dependent Surveillance -Contract (ADSC) are monitored in the NAT HLA against the RCP 240 and RSP 180 specifications. **From 29 March 2018** flights will be required to indicate compliance with these specifications in order to qualify for operations in airspace where reduced lateral and/or longitudinal separation minima are applied. Initially this will apply to the OTS between FL 350 and FL 390 inclusive but will be extended to the whole of the NAT HLA in due course. RCP and RSP compliance will also be required from March 2018 in the Asia/Pacific (APAC) Region and in other airspace in the future.

3 Required Communication Performance (RCP) 240 and Required Surveillance Performance (RSP) 180

- 3.1 The provision of PBCS in the NAT HLA applies RCP 240 and RSP 180 specifications to the application of 55.5 km (30 nm), 93 km (50 nm) and 5 minute longitudinal separation minima and application of a 42.6 km (23 nm) lateral separation minimum.
- 3.2 The Air Traffic Services (ATS) system, Communications Service/Satellite Service Provider (CSP/SSP) system, aircraft operator and the aircraft system must all comply with an RCP/RSP specification. The PBCS requirements for the design of the aircraft system concern its functionality, interoperability and performance in accordance with national airworthiness standards. There are no additional PBCS requirements concerning the production and airworthiness certificates other than those required by national regulations.
- 3.3 For UK aircraft operators there is no requirement to obtain a specific operational approval in order to qualify for RCP 240 and RSP 180. However, the conditions laid out in the following section must be met for a flight to be able to indicate its compliance with these specifications.

4 Operator Eligibility

- 4.1 Only those operators that satisfy the requirements of RCP 240 and RSP 180 will be eligible for the reduced separation minima afforded by these specifications in the NAT HLA. Minimum Navigation Performance Specification (MNPS) approval (issued prior to 1 January 2015) or NAT HLA MNPS approval remains a requirement. Operators will be eligible to indicate compliance with RCP 240 and RSP 180 provided that the aircraft are:
- (a) Required Navigation Performance (RNP) 4 compliant;
 - (b) Automatic Dependent Surveillance – Contract (ADS-C) equipped; and
 - (c) Controller Pilot Data Link Communications (CPDLC) equipped.
- 4.2 The above mentioned equipment must have been manufactured in accordance with the required technical specifications and the installation approved from an airworthiness perspective (normally stated in the Aeroplane Flight Manual) in accordance with the requirements for integrity, availability and continuity set out in the Performance Based Communication and Surveillance Manual (ICAO Doc 9869). The system must also provide flight crew with alerts associated with the RCP 240 and RSP 180 specifications and specific items related to PBCS capability must be included in the minimum equipment list (MEL). Any operational procedures are to be included in the operator's manuals (both flight and ground operations) using the Global Operational Data Link (GOLD) Manual (ICAO Doc 10037) and the PBCS Manual as Acceptable Means of Compliance. These procedures must include contingency/failure procedures and a process to report problems encountered by flight crews, dispatchers and maintenance personnel.
- 4.3 In addition to the above initial PBCS approvals will be granted according to the following criteria:
- (a) Those aircraft that have a PBCS Statement of Compliance (SOC) in the AFM;
 - (b) Those aircraft that, although there is no SOC in the AFM, have CPDLC and ADSC equipment installed that:
 - (i) Is approved in accordance with RTCA DO 306/EUROCAE ED 122;
 - (ii) Is installed in an approved manner.
 - (c) Those aircraft that do not satisfy the requirements of (a) and (b) above but whose PBCS compliance has been proved by the use of established performance monitoring and reporting procedures; and
 - (d) Satisfactory PBCS service provision is assured. This includes service provision principles being established between the aircraft operators and the Communication Service Providers (CSPs)/Satellite Service Providers (SSPs) in accordance with the PBCS Manual or the proposed PBCS Charter. It is accepted that such Service Level Agreements are unlikely to be established prior to March 2018 but a finite transition period should be determined at the end of which such agreements should be in place.
- 4.4 The required Communications/Navigation/Surveillance (CNS) systems must be operational and flight crews must report any failure or malfunction of GNSS, ADS-C or CPDLC equipment to Air Traffic Control (ATC) as soon as it becomes apparent.
- 4.5 The aircraft operator shall ensure that arrangements with the CSPs/SSPs stipulate the RCP/RSP allocations, including any monitoring or recording requirements. The aircraft operator shall also ensure that these arrangements include a provision for the CSP/SSP to notify the ATS units appropriate for the route system of the aircraft operator of failure conditions impacting PBCS operations.
- 4.6 The operator shall participate in ANSP and regional PBCS monitoring programmes which are applicable to its route system and shall provide the following information to regional PBCS monitoring entities specified in the Aeronautical Information Publication (AIP):
- (a) operator name;
 - (b) operator contact details; and
 - (c) other coordination information.

Any changes to the information listed above are to be notified to the appropriate PBCS monitoring entities.

- 4.7 The operator shall establish procedures to report problems encountered by flight crew or other personnel to the regional PBCS monitoring entities associated with the route of flight on which the problem occurred. The operator is also to establish procedures to disclose operational data, including that from its CSPs/SSPs, in a timely manner to the appropriate PBCS monitoring entity, when requested, for the purposes of investigating a reported problem.

5 Flight Planning

- 5.1 The operator shall ensure that the appropriate information to denote PBCS capabilities is included in the ICAO flight plan as follows:
- (a) All FANS 1/A CPDLC equipped aircraft planning to operate in the NAT HLA shall insert the appropriate designator (J2, J3, J4, J5 and/or J7) in Item 10a of the flight plan;
 - (b) All FANS 1/A CPDLC RCP 240 compliant aircraft intending to operate in the NAT HLA shall insert the designator P2 in Item 10a of the flight plan;
 - (c) All FANS 1/A ADS-C compliant aircraft planning to operate in the NAT HLA shall insert the designator D1 in Item 10b of the flight plan;
 - (d) All FANS 1/A ADS-C RSP 180 compliant aircraft planning to operate in the NAT HLA shall insert SUR/RSP180 in Item 18 of the flight plan; and
 - (e) All RNP 4 compliant aircraft planning to operate in the NAT HLA shall insert PBN/L1 in Item 18 of the flight plan.
- 5.2 From 29 March 2018 NAT ANSPs will apply the RCP 240 flight plan designator to determine aircraft eligibility for relevant separation minima.

6 Airspace Monitoring

- 6.1 Adequate monitoring of flight operations in the NAT HLA shall be conducted to assist in the assessment of continuing compliance of aircraft with PBCS requirements. NAT air navigation service providers shall establish PBCS monitoring programmes and, in coordination with their State authorities, implement one or all of the following mechanisms for communicating the PBCS monitoring information to the NAT HLA users and States:
- (a) Ongoing PBCS monitoring results to be directly shared through individual web-portals or made available by NAT ANSPs on request from State authorities or airspace users;
 - (b) The existing NAT Data Link Monitoring Agency (DLMA)/Pacific Central reporting Agency website, hosted by airways New Zealand, to be used to house the NAT monitoring results updated by the NAT ANSPs at a common, e.g. semi-annual interval;
 - (c) PBCS non-compliance to be communicated directly by NAT ANSPs and States to the NAT airspace users and States.
- 6.2 The NAT Central Monitoring Agency (CMA) shall implement a mechanism for communicating the PBCS non-compliance notifications received from NAT ANSPs to NAT airspace users and State authorities through the global network of Regional Monitoring Agencies (RMAs).
- 6.3 Exact details of PBCS monitoring procedures are still under discussion and will be communicated in due course.

7 Further Information

- 7.1 Further information on PBCS and data link operations can be found in the PBCS Manual (ICAO Doc 9869) and the GOLD Manual (ICAO Doc 10037) or from the following:

Airspace Regulation,
Safety And Airspace Regulation Group,
CAA House,
45-59 Kingsway,
London WC2B 6TE

Tel: 020 7453 6553
E-mail: anthony.stevens@caa.co.uk

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