APPENDIX A — IMPLEMENTATION PLAN AND TASK LIST FOR AN OPERATIONAL TRIAL OF ADVANCED SURVEILLANCE-ENHANCED PROCEDURAL SEPARATION (ASEPS) USING AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST (ADS-B)

(paragraph 2.15 refers)

1. INTRODUCTION

1.1 Advancements in aircraft avionics and air traffic management flight data processing systems, further augmented by the anticipated availability of Air Traffic Services (ATS) surveillance capability in the North Atlantic (NAT) Region via reception of Automatic Dependent Surveillance – Broadcast signals, by a constellation of Low Earth Orbiting Satellites (LEOS), has driven analysis of whether the lateral and longitudinal separation standards in the current NAT High Level airspace could be reduced to increase the efficiency of the airspace.

1.2 NAT SPG Conclusion 50/07 supported expanded use of ATS surveillance capability using space-based reception of ADS-B signals. As the NAT Region was envisaged as the first place that space-based ADS-B ATS surveillance would be used, the NAT SPG agreed that the NAT Implementation Management Group (IMG) and NAT Safety Oversight Group (NAT SOG) provide input and identify all activities supporting the implementation of an ATS surveillance service.

1.3 The ICAO Separation and Airspace Safety Panel (SASP) has developed 'advanced surveillance-enhanced procedural separation minima' (ASEPS) that can be used in airspace where ADS-B service is provided but VHF voice is not available. The SASP has agreed on amendments to the Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM; Doc 4444) and it is anticipated that these amendments will become effective on 5 November 2020.

1.4 This Implementation Plan (and associated Task List) supports a trial implementation period beginning in March 2019 and follows the guidelines provided in ICAO Doc 9689 (Manual on Airspace Planning Methodology for Determination of Minima).

1.5 NAT SPG 53/5 agreed the following prerequisites (Table-1) that are to be fulfilled in order to enable an operational trial to use Space-Based Automatic Dependent Surveillance-Broadcast (SB ADS-B). Table-1 also references to Tasks that service these prerequisites.

Table 1

Prerequisite	Reference
The Separation and Airspace Safety Panel (SASP) has agreed minima and associated requirements for Advance Surveillance-Enhanced Procedural Separation (ASEPS).	Task 2
Implementing Air Navigation Service Providers (ANSP) have;	
i) Completed ASEPS implementation plans aligned to the NAT SB ADS-B Concept of Operations (CONOPS) and the ICAO SASP output referred to above;	This Plan
ii) Confirmed their SB ADS-B service meets identified performance requirements;	Task 6
iii) Completed safety management activities as required by their respective regulatory authorities; and	Task 12/13/14
iv) Confirmed that the Performance Based Communication and Surveillance (PBCS) performance is measured and reported in the same manner as other applications of reduced separation in the NAT	
The plans and the outputs of the safety management activities referred to above have been reviewed by the NAT Implementation Management Group (NAT IMG) and the NAT Safety Oversight Group (NAT SOG);	Task 12/13 Task 14

Prerequisite	Reference
The NAT IMG and NAT SOG identify success criteria and trial duration;	Task 14
Neither the NAT IMG nor the NAT SOG identifies an issue that, in their opinion, requires resolution before an operational trial should commence;	-
The NAT IMG has confirmed that implementing ANSPs have completed all required implementation activities.	-
NAT SPG has approved the implementation plan and supporting task list that would also include the above listed prerequisites to enable a trial for implementation of ASEPS using ADS-B in the NAT Region	NAT SPG/54

2. IMPLEMENTATION PROCESS

2.1 The implementation process also considers ICAO implementation consideration guidance for regional, State or local safety assessments.

Table 2

Implementation Steps	
Step 1	Undertake widespread regional consultation with all possible stakeholders and other interested parties.
Step 2	Develop an airspace design concept or ensure that the proposed separation minima being implemented will fit the current airspace system and regional or state airspace planning strategy.
Step 3	Review appropriate manual noting specific assumptions, constraints, enablers and system performance requirements.
Step 4	Compare assumptions, enablers, and system performance requirements in the appropriate manual with the regional or State's operational environment, infrastructure and capability.
Step 5	If a region or State or ANSP has determined that the change proposal for that region or State is equal to or better than the reference, requirements and system performance in the appropriate manual, then the region or State must undertake safety management activities including:
Step 5a)	formal hazard and consequence(s) identification, as well as safety risk analysis activities including identification of controls and mitigators;
Step 5b)	implementation plan;
Step 5c)	techniques for hazard identification/safety risk assessment which may include: 1) the use of data or experience with similar services/changes; 2) quantitative modelling based on sufficient data, a validated model of the change, and analysed assumptions; 3) the application and documentation of expert knowledge, experience and objective judgment by specialist staff; and 4) a formal analysis in accordance with appropriate safety risk management techniques as set out in the *Safety Management Manual* (Doc 9859);
Step 5d)	identification and analysis of human factors issues identified with the implementation including those associated with Human Machine Interface matters;
Step 5e)	simulation where appropriate;
Step 5f)	operational training; and
Step 5g)	regulatory approvals

Implementation Steps	
Step 6	If a region or State has determined that the change proposal for that region or State is not equal to the requirements and system performance in the appropriate manual, then the region or State must: i) consider alternative safety risk controls to achieve the technical and safety performance that matches the reference in the appropriate manual; or, ii) conduct appropriate quantitative risk analysis for the development of a local standard in accordance with the *Manual on Airspace Planning Methodology for the Determination of Separation Minima* Doc 9689.
Step 7	Develop suitable safety assessment documentation including a safety plan and associated safety cases.
Step 8	Implementation activities should include:
Step 8 i)	trial under appropriate conditions;
Step 8 ii)	expert panel to undertake scrutiny of proposals and development of identified improvements to the implementation plan;
Step 8 iii)	develop an appropriate backup plan to enable reversion if necessary; and
Step 8 iv)	continuous reporting and monitoring results of incidents, events, observations.
Step 9	Develop a suitable post-implementation monitoring and review processes.

2.2 The 'Task List' supporting the Implementation Plan for Trial of Space Based Automatic Dependent Surveillance – Broadcast (ADS-B) Separations in the ICAO NAT Region is contained in **Attachment A**.

3. IDENTIFICATION OF THE NEED FOR CHANGE

3.1 NAT customers request more fuel-efficient flight profiles and routes that will reduce operating costs and show a return on operator investment in aircraft avionics. Applying a reduced lateral and longitudinal separation is expected to enhance the provision of fuel-efficient profiles and routes with minimal change to NAT operations.

3.2 The new separation standard is expected to result in a reduction in fuel burn and a consequent reduction in greenhouse gas emissions through an increased likelihood of flights being able to operate at their optimum routes and flight levels either through initial oceanic clearances and ability to be issued mid ocean-ocean altitude "step climb" clearances or dynamic re-routes.

3.3 There is added benefit of allowing return on operator investment in aircraft avionics without requiring a change from current High Level Airspace (HLA) and performance based communication and surveillance (PBCS) authorizations.

3.4 It is anticipated that, as traffic levels have been shown to steadily increase, the ability to track aircraft conformance to the ATC cleared route profile via real time surveillance will increase safety and lower the collision risk estimate in the areas where ATS surveillance services are provided.

4. DESCRIPTION OF CURRENT AIRSPACE AND THE CNS / ATM SYSTEMS

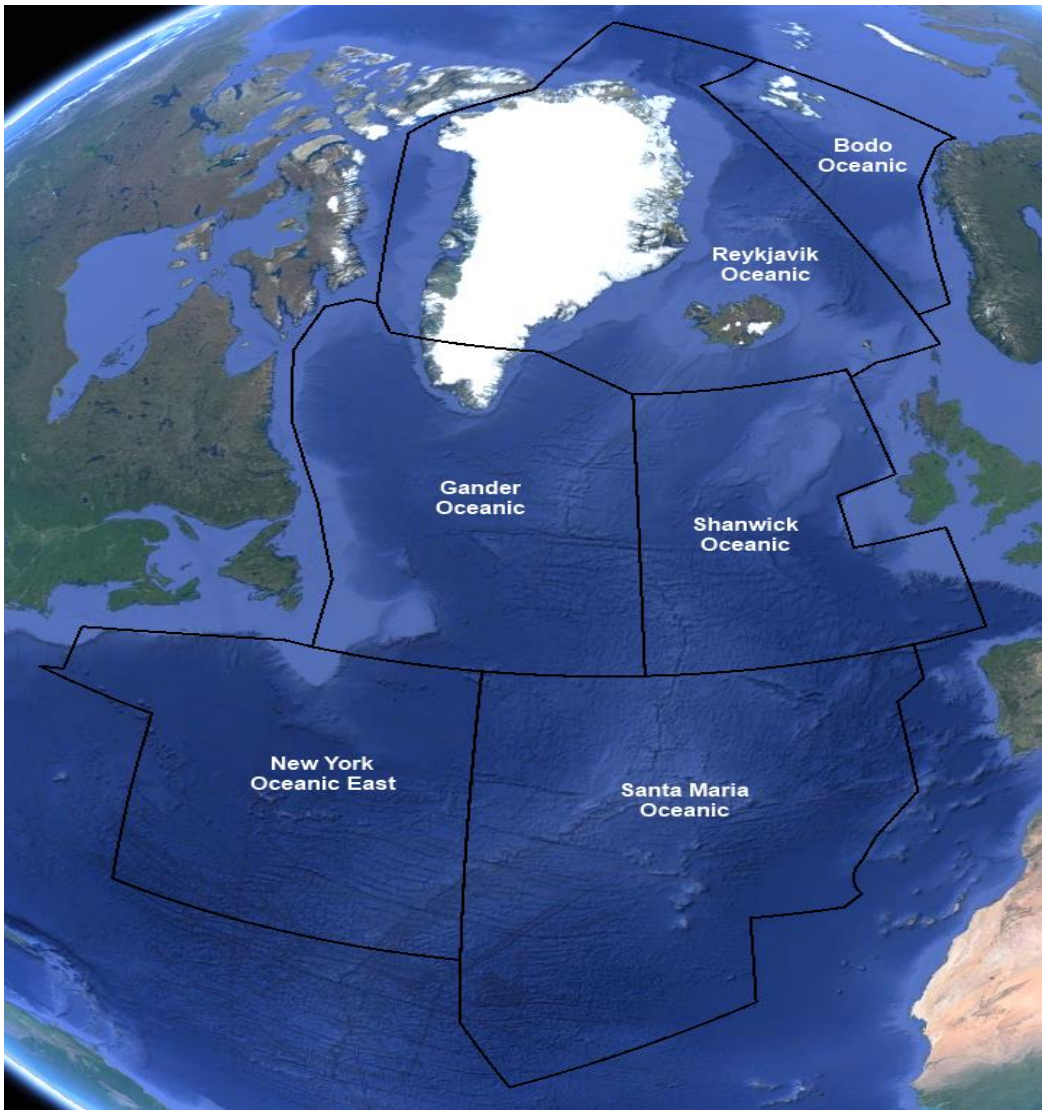
4.1 Airspace Structure

4.1.1 The responsibility for air traffic control services within the North Atlantic (NAT) Region is shared among nine states: Canada, Denmark, France, Iceland, Ireland, Norway, Portugal the United Kingdom and the United States.

4.1.2 The NAT Region mainly consists of Class A airspace; in which Instrument Flight Rules (IFR) apply at all times. Class A airspace has been established at and above FL 55 except in the Bodø Oceanic Control Area (OCA) and in the Nuuk Flight Information Region (FIR) where it has been established above FL 195 and in the domestic portion of the Reykjavik Flight Information Region (FIR) where it has been established at and above FL 200.

4.1.3 The NAT Region comprises the following FIRs/CTAs: Bodø Oceanic, Gander Oceanic, New York East Oceanic, Nuuk, Reykjavik, Santa Maria and Shanwick.

4.1.4 Traffic is controlled by Oceanic centres at Reykjavik, Bodø, Gander, New York, Santa Maria, and Prestwick and by Shannon and Brest ACCs.



4.1.5 NAT traffic is predominantly commercial. International General Aviation (IGA) Business aircraft comprise a high proportion of the higher altitude airspace operations.

4.1.6 For most of the North Atlantic (NAT) airspace ATS surveillance and VHF voice communications is unavailable. With the exception of the trans-Atlantic surveillance corridor connecting the continents via the southern part of Reykjavik CTA and the north-western part of Gander CTA, air traffic management is primarily procedural in nature, although parts of other CTAs also enjoy the benefits of ATS surveillance. These parts consist of Bodø oceanic airspace with the exception of the north-west part, the NOTA, SOTA and BOTA airspaces in the eastern portion of Shanwick FIR controlled by Shannon and Brest ACCs and in the central portion of the Santa Maria OCA where ATS surveillance services are provided.

4.2 Strategic Lateral Offset Procedure (SLOP)

4.2.1 Currently, strategic lateral offsets of up to two miles right of a route or track centreline have been introduced as a means of reducing collision risk and is now standard operating procedure in the entire NAT Region. The NAT Region is considering implementation of lateral offsets of tenths of a nautical mile up to a maximum of 3.7 km (2 NM) as per the provisions published in the PANS ATM Chapter 16.5.

4.3 Airborne Collision Avoidance System (ACAS)

4.3.1 In addition to the requirements of Annex 6, (Part I paragraph 6.16 and Part II, paragraph 6.14) ACAS II shall be carried and operated in the NAT Region by all turbine-engine aircraft having a maximum certified take-off mass exceeding 5700kg or authorized to carry more than 19 passengers.

4.4 Navigation Performance Specifications

4.4.1 The NAT High Level Airspace (HLA) is established between FL285 and FL420. To ensure the safe application of separation between aircraft in the NAT HLA airspace, aircraft normally need to have a MNPS approval or a NAT HLA MNPS approval to operate within this part of the NAT airspace. An exception to this is that non-approved aircraft are allowed to enter the NAT HLA airspace if the following conditions are satisfied:

- The aircraft is provided with an ATS Surveillance service; and
- The aircraft is in Direct controller pilot communications on VHF; and
- The aircraft has a certified installation of equipment providing it with the ability to navigate along the cleared track.

4.4.2 The NAT HLA was established to ensure that the risk of collision as a consequence of a loss of horizontal separation would be contained within an agree Target Level of Safety (TLS). The navigation component of the MNPS approval is based on the Annex 6 MNPS requirements and the navigation component of the NAT HLA MNPS approval is based on the RNAV 10 or RNP4 requirements.

4.5 ATM Systems

4.5.1 The general flight data processing systems (FDPs) and associated ancillary equipment employed by the six CTAs for the implementation of Communication Navigation Surveillance/Air Traffic Management have a high level design that supports;

- General flight data processing
- Profile conformance monitoring
- Conflict probing
- Numerous controller support tools
- Electronic progress display (flight progress strips or situational graphical display)
- Automatic internal and external coordination through on-line data interfaces
- FANS1/A ADS-C and CPDLC
- ARINC 623 Oceanic Clearance Delivery
- Multi radar or ADS-B data processing and graphical display
- Flight message prioritisation and display queue

5. TRAFFIC PATTERNS & PROCEDURAL SEPARATION MINIMA

5.1 General

5.1.1 The traffic is dominated by two major axes. First, there is the axis linking Europe (and the Middle East) to North America (excluding Alaska). Second is the axis linking Europe to the Caribbean,

Canaries, and South America. A substantial proportion of NAT traffic, namely that operating between cities in Europe and those in North America operate on the first axis.

5.1.2 The major traffic flow between Europe and North America takes place in two distinct traffic flows during each 24-hour period due to passenger preference, time zone differences and the imposition of night-time noise curfews at the major airports. The majority of the Westbound flow leaves European airports in the late morning to early afternoon and arrives at Eastern North American coastal airports typically some 2 hours later - local time - given the time difference. The majority of the Eastbound flow leaves North American airports in mid/late evening and arriving in Europe early to mid-morning - local time. Consequently, the diurnal distribution of this traffic has a distinctive tidal pattern characterised by two peaks passing 30° W, the Eastbound centred on 0400 Universal Co-ordinated Time (UTC) and the Westbound centred on 1500 UTC.

5.2 North Atlantic Organised Track System (NAT OTS)

5.2.1 Although a number of fixed trans-Atlantic tracks exist, about 50% of traffic operates on tracks, which vary from day to day dependent on meteorological conditions. The variability of the wind patterns would make a fixed track system unnecessarily penalising in terms of flight time and consequent fuel usage.

5.2.2 The OTS is set up on a diurnal basis for each of the Westbound and Eastbound flows. Each core OTS is comprised of a set, typically 4 to 7, of parallel or nearly parallel tracks, positioned in the light of the prevailing winds to suit the traffic flying between Europe and North America.

5.2.3 The designation of an OTS facilitates a high throughput of traffic by ensuring that aircraft on adjacent tracks are separated for the entire oceanic crossing - at the expense of some restriction in the operator's choice of track. In effect, where the preferred track lies within the geographical limits of the OTS, the operator is obliged to choose an OTS track or fly above or below the system. Where the preferred track lies clear of the OTS, the operator is free to fly it by nominating a random track. Trans-Atlantic tracks, therefore, fall into three categories: OTS, Random or Fixed.

5.3 Separation

5.3.1 Procedural Separation Application - The separation minima applied within the NAT Region airspace vary greatly depending on aircraft class (jet, prop), communication, navigational and surveillance capability, as well as FIR application. NAT Doc 008 (Application of Separation Minima) contains the latest information and references to the separations being applied. For most of the North Atlantic the following separations are applied.

5.3.2 Longitudinal Separation

5.3.2.1 Same Direction up to 90 degrees:

- 10 minutes using Mach Number Technique (MNT);
- 5 to 9 minutes using MNT with speed differential;
- 5 minutes between RCP240/RSP180 compliant aircraft;
- 15, or 10 minutes between flights intersecting routes, depending on aircraft equipage;
- 50NM RNP 10 (ADS-C periodic contract rate of 27 minutes) and RCP240/RSP180 compliant aircraft;
- 50NM RNP 4 (ADS-C periodic contract rate of 32 minutes) and RCP240/RSP180 compliant aircraft;
- 30NM RNP 2/4/10 (ADS-C periodic contract rate of 12 minutes) and RCP240/RSP180 compliant aircraft.

5.3.2.2 Opposite Direction Separation:

- Vertical separation is required from 15minutes before until 15 minutes after the estimated passing point;
- Vertical separation is required from 15 minutes before until 10 minutes after the estimated passing point if the flights have reported over a common point.

5.3.2.3 Opposite-direction aircraft on reciprocal tracks may be cleared to climb or descend to or through the levels occupied by another aircraft provided that ADS-C reports show that the aircraft have passed each other by the applicable separation minimum.

5.3.3 Lateral Separation

5.3.3.1 The lateral separation minima applied between aircraft tracks in the airspace vary according to communication, navigational and surveillance capability and FIR application (see NAT Doc 008). For most of the North Atlantic the following separations are applied:

- 60NM or 1 degree. 'Gentle Slope Rules' have been adopted to ensure that the actual separation never falls below distances which vary with latitude but never fall short of 50.5NM.
- 50NM between RNP10.
- 23NM between RNP4 and RCP240/RSP180 compliant aircraft.

5.3.4 Reduced Vertical Separation Minimum (RVSM)

5.3.4.1 RVSM airspace has been established within the confines of MNSP/HLA airspace and associated transition areas. In RVSM airspace, 1000 ft. vertical separation is applied between approved aircraft. Currently, RVSM is only applied between FL 290 and FL 410 inclusive. To ensure the safe application of the separation minimum, only RVSM approved aircraft are allowed to operate within RVSM airspace. Aircraft are monitored to ensure that the TLS is being met.

6. COMMUNICATION, NAVIGATION, SURVEILLANCE

6.1 Communication

6.1.1 Air / Ground Communication

6.1.1.1 For the most part the communications possibilities within the North Atlantic are:

- HF voice communications via Aeradio;
- FANS1/A CPDLC;
- SATCOM voice via Aeradio;
- Oceanic Clearance Delivery via ARINC 623 datalink or VHF communications.

6.1.1.2 Direct controller pilot and general purpose VHF voice communications is available in limited areas of coverage within the North Atlantic, namely close to landmass where VHF receivers and transmitters can be located, such as within the Iceland FIR/CTA. Details of communications services provided are contained within State AIPs.

6.1.1.3 All aircraft operating within the North Atlantic shall maintain continuous watch on the appropriate frequency unless engaged in direct controller pilot communications with the appropriate ATC Control. HF RTF communication equipment with appropriate frequencies available is mandatory outside VHF coverage. When operating outside VHF coverage aircraft are required to be equipped with dual long range voice communications system (HF or SATCOM).

6.1.2 Ground / Ground Communication

6.1.2.1 Communication between sectors and ANSPs within the North Atlantic is primarily affected through interactions with the Flight Data Processing System (FDPS) via On-Line Data link Interfaces. This is used for initial coordination (and in many cases re-coordination) of flights crossing the common boundary. All voice coordination between ANSPs is effected via dedicated phone lines.

6.2 Navigation

6.2.1 The required navigation performance of aircraft operating in the NAT HLA is specified in the NAT section of DOC 7030.

6.2.2 Except when operating on the special "Blue Spruce Routes" as defined in NAT Doc 007 or under the exemption described in section 4.4.1 above aircraft operating in the NAT HLA are required to carry two independent long range navigation systems.

6.2.3 MNPS/HLA aircraft navigate mostly using GNSS and IRS/INS. Several ground based navigations aids such as VOR, NDB and DME are available in Iceland, and Santa Maria but those aids are scarce and far between and do therefore not significantly contribute towards the navigation performance.

6.3 Surveillance

6.3.1 ATS Surveillance services (radar, ADS-B and Multilateration) are provided within some portions of the NAT HLA airspace, where radar- and/or ADS-B and/or Multilateration coverage exists. The ATS Surveillance services are provided in accordance with the ATS Surveillance services procedures in the PANS ATM (DOC 4444).

6.3.2 All aircraft operating as IFR flights anywhere within the NAT Region are required to be equipped with a pressure-altitude reporting SSR transponder and may therefore benefit from such radar and multilateration air traffic services, currently offered in the parts of the Bodø, Reykjavik, Gander, Shanwick, Santa Maria and New York oceanic areas.

6.3.3 ADS-B services have for some time been available in some continental airspaces immediately adjacent to the NAT Region and are now provided within portions of the NAT HLA airspace, specifically in the Gander, Reykjavik and Santa Maria OCAs. Eligibility for ADS-B service in the NAT is based upon the provisions in the NAT Regional Supplementary Procedures (ICAO Doc 7030) section 5.6.

6.3.4 SASP agreed that downlinked ADS-B position performance level will be NIC $\geq$ 4 and NACP $\geq$ 5 (NUCP $\geq$ 4). In addition, the standard deviation values employed in the ASEPS CRM would utilize a standard deviation (σ) value of 0.204 NM for non-radar airspace.

6.3.5 Data will not be used by the ATC system for determining aircraft position when, as specified in ICAO Doc 7030, any of the position quality indicators have a value of 0 (zero). Consequently, an aircraft carrying 1090 MHz extended squitter (1090ES) ADS-B equipment shall disable ADS-B transmission unless:

a) the aircraft emits position information of an accuracy and integrity consistent with the transmitted values of the position quality indicator; or

b) the aircraft always transmits a value of 0 (zero) for one or more of the position quality indicators (NUCp, NIC, NAC or SIL), when the requirements of a) above cannot be met; or

c) the operator has received an exemption granted by the appropriate ATS authority.

Note.— The following documents provide guidance for the installation and airworthiness approval of ADS-B OUT system in aircraft and ensure compliance with a) above:

1. European Aviation Safety Agency (EASA) AMC 20-24; or
2. FAA AC No. 20-165A — Airworthiness Approval of ADS-B; or
3. Configuration standards reflected in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia.

6.3.6 North Atlantic States providing ADS-B Air Traffic Services maintain a common exclusion list of aircraft that are known to not satisfy the conditions promulgated by Doc 7030. The purpose of the exclusion list is to ensure that ADS-B reports received from such aircraft are not utilized by the air traffic control system for separation services. Gander, Reykjavik and Santa Maria have been using this list and Shanwick will begin doing so.

6.3.7 Aircraft operators wishing to receive an exemption from the procedures specified above for an individual flight shall apply for an exemption to the ATS unit(s) in accordance with AIP directives. Any approvals for such exemptions may be contingent on specific conditions such as routing, flight level and time of day.

7. DETERMINATION OF PROPOSED SYSTEM

7.1 General

7.1.1 The space-based ADS-B system will consist of a constellation of LEO satellites hosting ADS-B receivers. A satellite will receive ADS-B data including position, velocity and altitude from aircraft, which is then routed through other satellites and down-linked to a satellite operations ground station from where it is on-forwarded to Shanwick and Gander. Santa Maria will utilise the existing ground based ADS-B system.

7.1.2 Application of the ATS surveillance based procedural separation will be aligned between Gander and Shanwick by applying the same conditions for separation. No changes will be made to other procedural separations being applied between Shanwick and Gander and other ANSPs.

7.1.3 The current ADS-B coverage in Santa Maria does not allow for transfer of traffic to and from Gander and Shanwick using ASEPS. If SB ADS-B becomes available in Santa Maria during the Trial, this will be reassessed.

7.1.4 Application of the ATS surveillance based procedural separations will require RCP 240 (Required Communication Performance approvals as per NAT SPG conclusion 52/19 (PBCS Operator Requirements in the NAT Region) and contained in the Performance-Based Communication and Surveillance (PBCS) Manual (Doc 9869) and RNP 4.

7.1.5 PBCS designators will be required in the flight plan as per NAT SPG conclusion 52/20 and shall be included in inter-coordination between all adjacent ANSPs.

7.1.6 There will be no change to non VHF direct controller-pilot communications infrastructure or procedures using CPDLC, as contained in the Global Operations Data Link (GOLD) Manual (Doc 10037), and Satellite Voice Operations Manual (Doc 10038.).

7.1.7 FANS1/A ADS-C waypoint change event contracts and CPDLC confirm assigned route [UM137/DM40] will continue to be utilised to extract intent data (NEXT and NEXT+1) from the flight's FMS as part of conformance monitoring.

7.1.8 Automated position report overdue monitoring will include the monitoring of the receipt of ADS-B signals from a flight prior to and within the FIR. Non-receipt of an ADS-B signal for a defined period will raise an alert to the controller and provide conflict probe results based on the appropriate non ADS-B criteria.

7.1.9 Conformance monitoring of longitudinal positions shall be ensured through automated ground based monitoring of reported position against system estimated positions. ADS-B reports will be used to update the flight profile through a system conflict probe which will re-calculate the estimated times for ensuing positions.

7.1.10 Post implementation monitoring will be applied to space-based surveillance enabled procedural separations in accordance with practises outlined in Annex 19, and as outlined in Circular 343 (Guidelines for the Implementation of Performance-based Longitudinal Separation Minima).

7.2 Separation minima using ATS Surveillance systems where VHF voice communications are not available

7.2.1 Application of the ATS Surveillance based procedural longitudinal separation will be as per the PANS ATM, Doc 4444 proposal for amendment from the ICAO SASP, as excerpted below:

a) 14 NM longitudinal separation of aircraft operating on same identical tracks or intersecting tracks provided that the relative angle between the tracks is less than 45 degrees.

b) 17 NM longitudinal separation of aircraft operating on intersecting tracks provided that the relative angle between the tracks is less than 90 degrees.

c) Opposite-direction aircraft on reciprocal tracks may be cleared to climb or descend to or through the levels occupied by another aircraft provided that the aircraft have reported by ADS-B having passed each other by 5 NM.

Lateral Separation

7.2.2 Application of the ATS Surveillance based procedural lateral separation will be as per the PANS ATM, Doc 4444 proposal for amendment from the ICAO SASP, as excerpted below:

a) 19 NM lateral spacing between parallel or non-intersecting tracks.

7.2.3 The separation minima described above may be applied utilizing position information derived from an ATS Surveillance system, provided the following requirements are met:

a) A navigational performance of RNP 4 or the applicable RNP 2 shall be prescribed; and

b) The communication system shall satisfy RCP 240; and

c) An alternate means of communication shall be available to allow the controller to intervene and resolve a conflict within a total time of 9 minutes should the normal means of communication fail; and

d) Lateral conformance monitoring shall be ensured by the use of:

   a) lateral deviation warning using ATS surveillance system data with a warning threshold set at 3 NM. Higher warning thresholds may be set provided the lateral separation minimum in paragraph 7.2.2 above is increased by the same amount; and

   b) The ATS ground system shall prioritize and enable immediate recognition by the controller of the lateral deviations in a) above.

Special Procedures for In-flight Contingencies in Oceanic Airspace

7.2.4 Coincident with the separations listed above, the SASP has proposed changes to ICAO Doc 4444 Contingency Procedures. The procedures are indicated below and will be implemented coincident with ASEPS.

7.2.5 Introduction

7.2.5.1 Although all possible contingencies cannot be covered, the procedures in 7.2.6, 7.2.7 and 7.2.8 provide for the more frequent cases such as:

a) inability to comply with assigned clearance due to meteorological conditions, (7.2.8 refers);

b) en-route diversion across the prevailing traffic flow (for example, due to medical emergencies (7.2.6 and 7.2.7 refer)); and

c) loss of, or significant reduction in, the required navigation capability when operating in an airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations, or pressurization failure (7.2.6 and 7.2.7 refer).

Note.— Guidance on procedures to follow when an aircraft experiences a degradation in navigation capabilities can be found in PANS-ATM, Chapter 5, section 5.2.2.

7.2.5.2 The pilot shall take action as necessary to ensure the safety of the aircraft, and the pilot's judgement shall determine the sequence of actions to be taken, having regard to the prevailing circumstances. Air traffic control shall render all possible assistance.

7.2.6 General procedures

Note.— Figure 7-1 provides an aid for understanding and applying the contingency procedures contained in paragraph 7.2.6 and 7.2.7.

7.2.6.1 If an aircraft is unable to continue the flight in accordance with its ATC clearance, a revised clearance shall be obtained, whenever possible, prior to initiating any action.

7.2.6.2 If prior clearance cannot be obtained, the following contingency procedures should be employed until a revised clearance is received:

a) leave the cleared route or track by initially turning at least 30 degrees to the right or to the left, in order to intercept and maintain a parallel, direction track or route offset 9.3 km (5.0 NM). The direction of the turn should be based on one or more of the following:

   1) aircraft position relative to any organized track or route system,

   2) the direction of flights and flight levels allocated on adjacent tracks,

   3) the direction to an alternate airport;

   4) any strategic lateral offset being flown, and

   5) terrain clearance;

b) the aircraft should be flown at a flight level and an offset track where other aircraft are less likely to be encountered.

c) maintain a watch for conflicting traffic both visually and by reference to ACAS (if equipped) leaving ACAS in RA mode at all times, unless aircraft operating limitations dictate otherwise;

d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);

e) keep the SSR transponder on at all times and, when able, squawk 7700, as appropriate;

f) as soon as practicable, the pilot shall advise air traffic control of any deviation from assigned clearance;

g) use whatever means is appropriate (i.e. voice and/or CPDLC) to communicate during a contingency or emergency;

h) if voice communication is used, the radiotelephony distress signal (MAYDAY) or urgency signal (PAN PAN) preferably spoken three times, shall be used, as appropriate;

i) when emergency situations are communicated via CPDLC, the controller may respond via CPDLC. However, the controller may also attempt to make voice communication contact with the aircraft;

Note.— Additional guidance on emergency procedures for controllers, radio operators, and flight crew in data link operations can be found in the Global Operational Data Link (GOLD) Manual (Doc 10037).

j) establish communications with and alert nearby aircraft by broadcasting, at suitable intervals on 121.5 MHz (or, as a backup, on the inter-pilot air-to-air frequency 123.45 MHz) and where appropriate on the frequency in use: aircraft identification, the nature of the distress condition, intention of the person in command, position (including the ATS route designator or the track code, as appropriate) and flight level; and

k) the controller should attempt to determine the nature of the emergency and ascertain any assistance that may be required. Subsequent ATC action with respect to that aircraft shall be based on the intentions of the pilot and overall traffic situation.

7.2.7 Actions to be taken once offset from track.

Note. — The pilot's judgement of the situation and the need to ensure the safety of the aircraft will determine whether the actions outlined in 7.2.7.2 a) or b), will be taken. Factors for the pilot to consider when diverting from the cleared route or track without an ATC clearance include, but are not limited to:

a) operation within a parallel track system,
b the potential for User Preferred Routes (UPRs) parallel to the aircraft's track or route,
c) the nature of the contingency (e.g. aircraft system malfunction) and
d) weather factors (e.g. convective weather at lower flight levels).

7.2.7.1 If possible maintain the assigned flight level until established on the 9.3 km (5.0 NM) parallel, same direction track or route offset. If unable, initially minimize the rate of descent to the extent that is operationally feasible.

7.2.7.2 Once established on a parallel, same direction track or route offset by 9.3 km (5.0 NM), either:

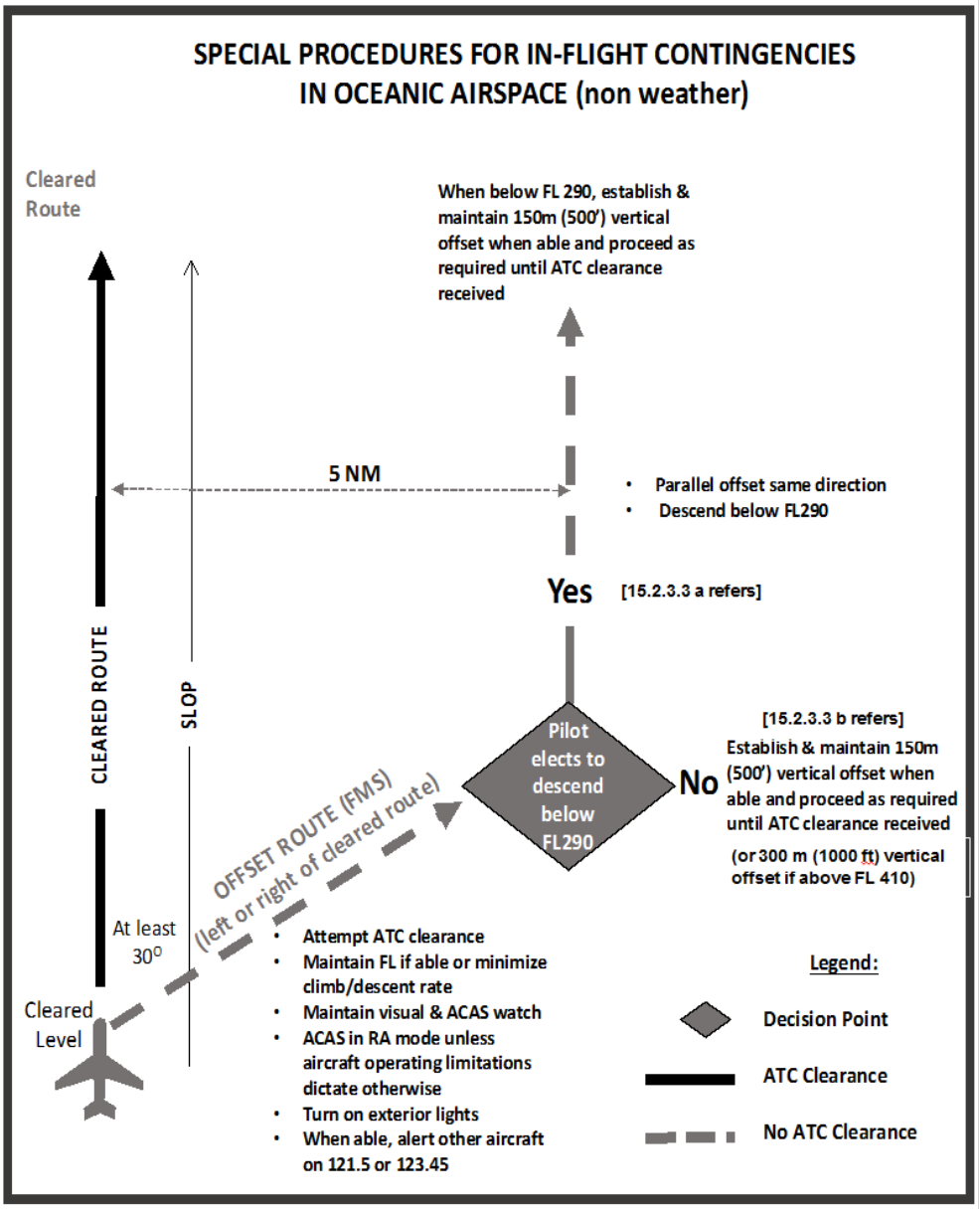
a) descend below FL 290, and establish a 150 m (500 ft) vertical offset from those flight levels normally used, and proceed as required by the operational situation or if an ATC clearance has been obtained, proceed in accordance with the clearance; or

Note. — Descent below FL 290 is considered particularly applicable to operations where there is a predominant traffic flow (e.g. east-west) or parallel track system where the aircraft's diversion path will likely cross adjacent tracks or routes. A descent below FL 290 can decrease the likelihood of: conflict with other aircraft, ACAS RA events and delays in obtaining a revised ATC clearance.

b) establish a 150 m (500 ft) vertical offset (or 300 m (1000 ft) vertical offset if above FL 410) from those flight levels normally used, and proceed as required by the operational situation, or if an ATC clearance has been obtained, proceed in accordance with the clearance.

Note. — Altimetry System Error may lead to less than actual 500 ft vertical separation when the above procedure is applied. In addition, with the 500 ft vertical offset applied, ACAS RAs may occur.

Figure 7-1. Visual aid for understanding and applying the contingency procedures guidance.



7.2.8 Weather deviation procedures

7.2.8.1 GENERAL

Note.— The following procedures are intended for deviations around adverse meteorological conditions.

7.2.8.1.1 When weather deviation is required, the pilot should initiate communications with ATC via voice or CPDLC. A rapid response may be obtained by either:

a) stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency and for ATC response; or

b) requesting a weather deviation using a CPDLC lateral downlink message.

7.2.8.1.2 When necessary, the pilot should initiate the communications using the urgency call "PAN PAN" (preferably spoken three times) or by using a CPDLC urgency downlink message.

7.2.8.1.3 The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to its cleared route.

7.2.8.2 ACTIONS TO BE TAKEN WHEN CONTROLLER-PILOT COMMUNICATIONS ARE ESTABLISHED

7.2.8.2.1 The pilot should notify ATC and request clearance to deviate from track or route, advising, when possible, the extent of the deviation requested. The flight crew will use whatever means is appropriate (i.e. voice and/or CPDLC) to communicate during a weather deviation.

Note.— Pilots are advised to contact ATC as soon as possible with requests for clearance in order to provide time for the request to be assessed and acted upon.

7.2.8.2.2 ATC should take one of the following actions:

a) when appropriate separation can be applied, issue clearance to deviate from track; or

b) if there is conflicting traffic and ATC is unable to establish appropriate separation, ATC shall:

1) advise the pilot of inability to issue clearance for the requested deviation;

2) advise the pilot of conflicting traffic; and

3) request the pilot's intentions.

7.2.8.2.3 The pilot should take the following actions:

a) comply with the ATC clearance issued; or

b) advise ATC of intentions and execute the procedures detailed in 7.2.8.3.

7.2.8.3 ACTIONS TO BE TAKEN IF A REVISED ATC CLEARANCE CANNOT BE OBTAINED

Note.— The provisions of this section apply to situations where a pilot needs to exercise the authority of a pilot-in-command under the provisions of Annex 2, 2.3.1.

7.2.8.3.1 If the aircraft is required to deviate from track or route to avoid adverse meteorological conditions and prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time. Until an ATC clearance is received, the pilot shall take the following actions:

a) if possible, deviate away from an organized track or route system;

b) establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: aircraft identification, flight level, position (including ATS route designator or the track code) and intentions, on the frequency in use and on 121.5 MHz (or, as a backup, on the inter-pilot air-to-air frequency 123.45 MHz);

c) watch for conflicting traffic both visually and by reference to ACAS (if equipped);

d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);

e) for deviations of less than 9.3 km (5.0 NM) from the originally cleared track or route remain at a level assigned by ATC;

f) for deviations greater than or equal to 9.3 km (5.0 NM) from the originally cleared track or route, when the aircraft is approximately 9.3 km (5.0 NM) from track, initiate a level change in accordance with Table 7-1;

g) if the pilot receives clearance to deviate from cleared track or route for a specified distance and, subsequently, requests, but cannot obtain a clearance to deviate beyond that distance, the pilot should apply an altitude offset in accordance with Table 15-1 before deviating beyond the cleared distance.

h) when returning to track or route, be at its assigned flight level when the aircraft is within approximately 9.3 km (5.0 NM) of the centre line; and

i) if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

Note.— If, as a result of actions taken under the provisions of 7.2.8.3.1, the pilot determines that there is another aircraft at or near the same flight level with which a conflict may occur, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

Table 7-1

Originally cleared track or route center line	Deviations ≥ 9.3 km (5.0 NM)	Level change
EAST (000° – 179° magnetic)	LEFT	DESCEND 90 m (300 ft)
	RIGHT	CLIMB 90 m (300 ft)
WEST (180° – 359° magnetic)	LEFT	CLIMB 90 m (300 ft)
	RIGHT	DESCEND 90 m (300 ft)

8. IDENTIFICATION OF THE METHOD OF SAFETY ASSESSMENT

8.1 The ICAO Separation and Airspace Safety Panel has conducted a full collision risk modelling for development of surveillance-enhanced procedural separations that will be published in the PANS ATM, Doc 4444 in November 2020.

8.2 The safety work will be described in an ICAO Manual, a draft of which is expected to be completed prior to trial commencement.

8.3 Implementing ANSPs will complete all the necessary safety work required by the regulatory authorities to sustain the trial.

9. MODIFICATION OF THE PROPOSED SYSTEM

9.1 System Changes

9.1.1 The following changes to the Gander and Shanwick ATC system to support the application of space-based ADS-B surveillance enhanced separations will be:

- Procedural conflict probe updated to incorporate the space-based ADS-B surveillance enhanced separations covered within this implementation plan.
- Reception and application of ADS-B signals to update flight profiles.
- Enhanced conformance monitoring of ADS-B signals against cleared flight profiles.
- Monitoring of ADS-B signal quality indicators (QI).
- Various enhanced controller Human Machine Interface (HMI) which include new separations monitoring tools, improved graphical situational display and updates to flight progress strips.

- Monitoring of PBCS designators for the application of surveillance-enhanced separations.
- Automated support to determine when variable speed or fixed speed clearances can be issued.
- Automated CPDLC continuity checking.
- Enhanced separation monitoring support requirements as outlined in Annex 19.
- Adaptation tools that define areas where ASEPS can be applied.

9.1.2 Further requirement for modification will be a result of constant assessment of the system performance.

9.1.3 As the Santa Maria system currently utilises ADS-B for the provision of an ATC service, the following changes to the Santa Maria ATC system to support the application ASEPS will be made:

- Procedural conflict probe updated to incorporate ASEPS covered within this implementation plan.
- Adaptation tools that define areas where ASEPS can be applied.

9.1.4 Application of the ASEPS minima includes elements of both procedural control and ATS surveillance services and implementers are directed to refer to Annex 1 for applicable air traffic controller rating requirements. The applicable air traffic controller rating for use of ASEPS has been validated as part of safety management activities coordinated through the respective civil aviation authorities.

10. IMPLEMENTATION AND MONITORING OF THE PROPOSED SYSTEM

10.1.1 The longitudinal separation operational trial will commence 28 March 2019. Operators will be advised via Aeronautical Information Circular (AIC) of requirements of the trial applicable in advance and of operational trial details no less than two AIRAC cycles prior to implementation. Any delay in the implementation date or significant change to the implementation plans shall be notified by NOTAM as soon as the information is available.

10.1.2 The lateral separation operational trial will commence no earlier than 6 months after the commencement of the longitudinal separation operational trial. Operators will be advised via Aeronautical Information Circular (AIC) of requirements of the trial applicable in advance and of operational trial details no less than two AIRAC cycles prior to implementation. Any delay in the implementation date or significant change to the implementation plans shall be notified by NOTAM as soon as the information is available.

10.2 Eligible flights are those that meet all of the following requirements:

a) RVSM/HLA approval;

b) ADS-B, with dedicated 1090 Mhz out capability;

c) Aircraft meeting the specifications for RNP 4; and

d) Aircraft meeting the specifications of RCP 240 and RSP 180.

10.3 ATS systems use Field 10 (Equipment) of the standard ICAO flight plan to identify an aircraft's data link and navigation capabilities. The operator should insert the following items into the ICAO flight plan (as per the 2012 flight plan format) for FANS 1/A or equivalent aircraft:

a) Field 10a (Radio communication, navigation and approach aid equipment and capabilities);

i) insert "J5" to indicate CPDLC FANS1/A SATCOM (Inmarsat) or "J7" to indicate CPDLC FANS1/A SATCOM (Iridium) data link equipment;

ii) insert "P2" to indicate RCP 240 approval;

b) Field 10b (Surveillance equipment and capabilities);

i) insert "D1" to indicate ADS with FANS1/A capabilities; and

ii) B1 or B2 to indicate ADS-B.

c) Field 18 (Other Information); insert the characters "PBN/" followed by "L1" for RNP4 and SUR/RSP180

10.4 Monitoring of NAT communication system performance and analysis of problem reports will be assisted by the NAT Data Link Monitoring Agency (NAT DLMA).

Failures and degradations of systems

10.5 In the event of a data link system failure, provisions documented in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869), the Global Operational Data Link (GOLD) Manual (Doc 10037), are applicable.

11. STAKEHOLDER CONSULTATION

11.1 Operators have indicated that, for performance planning purposes, successful implementation of the reduced separations should be directly linked to consistent receipt of user requested flight profiles (route, flight level, speed).

11.2 Confidence in the ability to receive the requested profile will be expected to result in the preferred practice of loading appropriate fuel for flight duration as opposed to the current practice of loading fuel to account for numerous scenarios of not receiving the requested flight profile.

11.3 Operator flight planning systems are rule-based in consideration of standards, requirements and best practices for successful route filing. The current NAT operating environment, with its OTS track design, increases the requirement for rules/norms which inhibit optimal flight planning. Use of reduced separations should allow for reduction of current rules/norms which in turn would lead to increased flight profile optimization.

12. SUCCESS CRITERIA – Longitudinal Separation

QUESTIONS		METRICS, DETAILS & TARGETS	
Safety	Safety	i) Longitudinal	Scrutinize each longitudinal error to determine if the application of the 14 NM and 17 NM separations had an effect on the error. If such an effect is found then quantify the effect on the longitudinal risk. Target = No increase in longitudinal risk due to the application of the 14 NM and 17 NM separations.
		ii) Vertical	Scrutinize each longitudinal error to determine if the application of the 14 NM and 17 NM separations NM had an effect on the error. If such an effect is found then quantify the effect on the vertical risk. Target = No increase in vertical risk due to the application of the 14 NM and 17 NM separations.

		iii) Lateral	Scrutinize each longitudinal error to determine if the application of the 14 NM and 17 NM separations had an effect on the error. Lateral errors shall be determined and classified in accordance with direction provided via NAT SPG: That the: a) following definitions be used when classifying reports made to the NAT Central Monitoring Agency (NAT CMA): i) a lateral deviation is any actual deviation from the cleared track other than those covered by the Strategic Lateral Offset Procedures (SLOP); ii) a Gross Navigation Error (GNE) is a lateral deviation from a cleared track by 10 Nautical Miles (NM) or more; iii) an ATC intervention is an event where the Air Traffic Controller (ATCO) caught and corrected a lateral deviation before it developed into a GNE; and iv) an ATC prevention is an event where the ATCO intervention prevented a lateral deviation; and b) NAT CMA initiate GNE-related follow up actions in regard to GNEs of 10 NM or more. If such an effect is found then quantify the effect on the lateral risk. Target = No increase in lateral risk due to the application of the 14 NM and 17 NM separations.
	Safety	i) Monitor operator failures to correctly indicate ADSB & PBCS capabilities resulting in ineligible flights being placed on the 14 NM and 17 NM separations. • Scrutinize each failure to determine cause and source for the error. ii) Monitor failures to properly transmit valid position information by ADS-B. achieve FANS logon, or to maintain or transfer CPDLC connection resulting in ATC reverting to another form of separation • Scrutinize each failure to determine cause and source for the error. iii) Monitor communication and surveillance performance against RCP240 and the 14 NM and 17 NM separations. • NAT TIG scrutinizes the performance twice a year to verify compliance	

QUESTIONS		**METRICS, DETAILS & TARGETS**
Stakeholder Operational Efficiencies	Receipt of optimal profile: i. As flight planned ii. As requested Removal (or reduction) of flight planning rules and "norms" to enable fuel uplift reduction.	Implementing States to provide data on route, flight level and speed to the NAT SPG: i. Cleared vs flight planned (this element will cover successful receipt of random or OTS) ii. Cleared vs requested *Note: this data may be presented by means of a dashboard.* Implementing States to provide 60, 90, 180, 270 and 360 day milepost data to so that operators and ANSP can review and coordinate the potential for the strategic removal of flight planning practices based on improvements of ATM performance.

13. SUCCESS CRITERIA – LATERAL SEPARATION

13.1 TBD prior to commencement of 19 NM lateral separation.

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ATTACHMENT A - IMPLEMENTATION PLAN TASK LIST FOR AN OPERATIONAL TRIAL OF ADVANCED SURVEILLANCE-ENHANCED PROCEDURAL SEPARATION (ASEPS) USING AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST (ADS-B)

Task ID	Subject	KEY IMPLEMENTATION TASKS	Record of Updates	Next Step	LEAD(S) *NOTE: Leads will coordinate with groups identified in next column*	Coordination	Completion Date	Status
1	**Task List and Schedule**	Develop a Task List and Schedule for completion of individual tasks to prepare for commencement of, and during operational trial of ADS-B Separations.	Task List Developed POG/05. Task List updated at IMG/53	Most advanced draft of the implementation plan reviewed by SPG/54. IMG/SOG Review outcome of SPG/54 Review Task List at POG/06. Output of meetings consolidated and submitted by correspondence to IMG then SOG. Final material to IMG/53 for approval.	NAT POG	NAT IMG	September 2018 (POG/06)	Open/On Track
2	**Concept of Operations (CONOPS)**	Update CONOPS with ICAO SASP 2018 outputs, specifically update placeholders with separation values.	POG to provide updates from SASP outputs. POG/06 updated,	Submit updated CONOPS for review to POG/06.	NAT IMG	NAT POG	November 2018 (POG/06).	Closed

Task ID	Subject	KEY IMPLEMENTATION TASKS	Record of Updates	Next Step	LEAD(S) *NOTE: Leads will coordinate with groups identified in next column*	Coordination	Completion Date	Status
			CONOPS to include SASP separations and presented to IMG/53 SOD Para 4.79 refers. (IMG Decision 53/3.					
3	**Stakeholder Consultation**	Undertake regional consultation with appropriate stakeholders.	Consultation meeting 1 completed with updates incorporated into implementation plan and task list to be presented to NAT SPG/54	Canada & United Kingdom to arrange consultation of Implementation Plan before NAT SPG/54. Engage in coordinated planning to enable fuel uplift reductions NAT OPS Forum (Sept 2018)	United Kingdom, Canada & IATA	NAT POG NAT IMG	By NAT SPG/54 (June 2018). NAT IMG/53	Open / On Track
4	**Recommend target implementation date Longitudinal Trial**	Confirm implementation date via NAT SPG/54 Conclusion.	Target Implementation date 28 March 2019.	Update Task List with implementation date at POG/06.	NAT SPG	NAT POG NAT IMG	June 2018 (NAT SPG/54).	Complete
5	**Recommend target implementation**	Confirm implementation date via NAT SPG Conclusion	None.	Update Task List with implementation	NAT SPG	NAT IMG	March 2019 (POG/07).	Open / On Track

Task ID	Subject	KEY IMPLEMENTATION TASKS	Record of Updates	Next Step	LEAD(S) *NOTE: Leads will coordinate with groups identified in next column*	Coordination	Completion Date	Status
	date Lateral Trial	(possibly through correspondence).		date at POG/07.				
6	**Confirmed SB ADS-B service meets identified performance requirements**	LEOS confirmed as certified as a surveillance system.	None.	Certification to be confirmed.	NAT IMG	NAT POG	Prior to commencement of Trial.	Open / On Track
7	**ATC System Modification and operational readiness.**	Confirmation of ATC system modification and operational readiness schedule to support Operational Trial.	NAT POG/05 - Canada & United Kingdom agreed to provide update to NAT POG/06. Implementing States confirmed schedule in place to meet commencement of trial	Update Task List with confirmed system modification schedule at POG/06	Canada, the United Kingdom and Portugal	NAT POG	NAT POG/6	Closed

Task ID	Subject	KEY IMPLEMENTATION TASKS	Record of Updates	Next Step	LEAD(S) *NOTE: Leads will coordinate with groups identified in next column*	Coordination	Completion Date	Status
8	**ANSP Inter-Agreements**	Confirmation of ANSP inter-agreements to support / manage implementation of trials within Shanwick and Gander.	POG/05 - Canada & United Kingdom agreed to provide update to POG/06. Implementing States confirmed schedule in place to meet commencement of trial	Update Task List with confirmed inter-agreement schedule before commencement of trial.	Canada & United Kingdom and Portugal	NAT POG	September 2018 (NAT POG/06).	Closed
9	**Advance notice to User States and Operators (Longitudinal)**	Common wording for AIC NAT Ops Bulletin Longitudinal Trial.	NAT POG/06 - Action agreed on draft common wording for AIC. Draft wording NAT Ops Bulletin AIC agreed by IMG/53.	Submit to NAT IMG/53 for approval. Publish the approved AIC 2 AIRAC Cycles before start of trial Draft NAT Ops Bulletin AIC to be submitted to SOG/19.	NAT POG	NAT IMG	Minimum of 2 AIRAC Cycles before start of trial.	Open / On Track

Task ID	Subject	KEY IMPLEMENTATION TASKS	Record of Updates	Next Step	LEAD(S) *NOTE: Leads will coordinate with groups identified in next column*	Coordination	Completion Date	Status
10	**Advance notice to User States and Operators (Lateral)**	Common wording for AIC NAT Ops Bulletin Lateral Trial.	POG/05 - Action agreed to prepare draft common wording for AIC to POG/07.	Draft Common Wording. For AIC for review by POG/07.	NAT POG	NAT IMG	Minimum of 2 AIRAC Cycles before start of lateral trial.	Open / On Track
11	**ICAO State Letter**	Publication of State Letter confirming date of commencement of Operational Trials.	None	NAT IMG/53 and correspondence with NAT SPG Conclusion to publish State Letter.	NAT IMG	ICAO EUR/NAT Office	Minimum of 3 months prior to expected start of Trial	Open / On Track
12	**Pre-implementation Safety Assessment & Implementation Decision. (Longitudinal)**	Update and complete final Safety Assessment and Implementation Readiness Review to support implementation of trials.	None.	Complete Safety Assessment and Implementation Readiness Review no later than 3 months before implementation date as shown in **Task 4**. Safety Assessments to be presented to SOG/19.	NAT IMG	NAT SOG	No later than 3 months before implementation date as shown in **Task 4**.	Open / On Track

Task ID	Subject	KEY IMPLEMENTATION TASKS	Record of Updates	Next Step	LEAD(S) *NOTE: Leads will coordinate with groups identified in next column*	Coordination	Completion Date	Status
13	**Pre-implementation Safety Assessment & Implementation Decision. (Lateral)**	Update and complete final Safety Assessment and Implementation Readiness Review to support implementation of trials.	None.	Complete Safety Assessment and Implementation Readiness Review no later than 3 months before implementation date as shown in **Task 5.**	NAT IMG	NAT SOG	No later than 3 months before implementation date as shown in **Task 5**.	Open / On Track
14	**Post implementation monitoring**	Monitoring and reporting against trial, including monitoring against PBCS requirements for communications.	None.	Provide first monitoring report to NAT POG/8	NAT POG	NAT TIG Canada, the United Kingdom and Portugal	Commencement of Trial.	Open / On Track