INTERNATIONAL CIVIL AVIATION ORGANIZATION

SUMMARY OF DISCUSSIONS AND CONCLUSIONS OF

THE FIFTY- SECOND MEETING OF

THE NORTH ATLANTIC SYSTEMS PLANNING GROUP

Paris, 27 to 30 June 2016

PREPARED BY THE EUROPEAN AND NORTH ATLANTIC OFFICE OF ICAO JUNE 2016

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INTRODUCTION

PLACE AND DURATION

0.1 The Fifty-Second Meeting of the North Atlantic Systems Planning Group (NAT SPG) was held in the European and North Atlantic (EUR/NAT) Office of ICAO from 27 to 30 June 2016.

OFFICERS AND SECRETARIAT

0.2 The Meeting was chaired by Mr Ásgeir Pálsson, the Representative from Iceland. Mr Luis Fonseca de Almeida, ICAO Regional Director, Europe and North Atlantic, was the Secretary of the Meeting and he was assisted by Mr George Firican, Deputy Regional Director / Technical Team Leader, Ms Blandine Ferrier and Messrs Arkadii Merkulov, Celso Figueiredo, Christopher Keohan, Elkhan Nahmadov, Rodolphe Salomon, and Sarantis Poulimenakos, Regional Officers from the same Office; additional assistance was provided by Ms Patricia Caviston and Ms Patricia Cuff, also from the EUR/NAT Office of ICAO.

ATTENDANCE

0.3 The Meeting was attended by 29 participants from 9 States and 3 international organisations. In addition to the Representatives of the NAT SPG member States, representatives from the NAT Central Monitoring Agency (NAT CMA), NAT Document Management Office (NAT DMO), the International Air Transport Association (IATA) and the International Business Aviation Council (IBAC) attended the meeting. Apologies were received from the International Federation of Air Line Pilots Association (IFALPA) and the International Federation of Air Traffic Controllers' Association (IFATCA). Lists of participants and contacts are at **Appendix A**.

AGENDA

0.4 The NAT SPG agreed to the following agenda for organising the work of the Meeting and the structure of the report:

Agenda Item 1: Review of significant international aviation developments

Agenda Item 2: Proposed air navigation systems performance monitoring and measurement

Agenda Item 3: NAT planning and implementation management issues

- **3.1** Implementation programme updates
- **3.2** Performance monitoring

Agenda Item 4: NAT operational and safety improvements

Agenda Item 5: Safety Monitoring

Agenda Item 6: NAT Documentation

Agenda Item 7: Work programme, including sub-groups

Agenda Item 8: Any Other Business

1. REVIEW OF SIGNIFICANT INTERNATIONAL AVIATION DEVELOPMENTS

1.1 ICAO UPDATE

1.1.1 The ICAO Regional Director informed the meeting of several ICAO developments at the global and regional levels. These included preparations for the 39th ICAO General Assembly, the envisaged consolidation process of ICAO meetings in the European Region and the celebration of the 70th year of the ICAO Regional Office in Paris.

1.1.2 The NAT SPG was informed about recent significant international aviation developments and took note of the amendments to a number of ICAO Annexes and Procedures for Air Navigation Services (PANS) (Annexes 1, 2, 3, 4, 6, 8, 10, 11, 13, 14, 15, 18 and 19, *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444) and *Procedures for Air Navigation Services – ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400)) that had been adopted since April 2016. The NAT SPG was also informed about the proposed amendments to ICAO Annexes and PANS Documents (Annexes 10, 17, *Procedures for Air Navigation Services - Aircraft Operations* (PANS-OPS, Doc 8168), the 5th edition of the *Global Air Navigation Plan* (GANP, Doc 9750) and the 2017-2019 edition of the *Global Aviation Safety Plan* (GASP, Doc 10004)). A number of ICAO State Letters and ICAO Documents on a wide range of subjects had also been published since the last meeting. The NAT SPG also noted several ICAO global and NAT related meetings that would take place in the near future.

1.2 REVIEW BY THE AIR NAVIGATION COMMISSION OF THE NAT SPG/51 REPORT

1.2.1 The Secretariat presented the NAT SPG with the actions taken by the Air Navigation Commission (ANC) on the NAT SPG/51 Report. The NAT SPG recalled that following each Planning and Implementation Regional Group (PIRG) meeting, the report was first reviewed by the Working Group for Strategic Review and Planning (WG/SRP) of the ANC followed by the ANC itself. In the case of the NAT SPG/51 Report, as there were no specific items that required action by the Council, the report was not submitted to the Council.

1.2.2 The NAT SPG noted that the ANC WG/SRP had questioned the legality of conducting 25 nautical miles (NM) Reduced Lateral Separation Minima (RLatSM) trials in airspace over the high seas where the provisions of Annex 2 must be applied and requested that a legal opinion be sought. The Secretariat had explained that regional trials were conducted with the agreement of the airspace users and air navigation service providers (ANSPs) and processes were available to allow their conduct. The NAT SPG commented that the RLatSM trial planning and implementation were conducted through the NAT SPG mechanisms in full coordination and transparency with all North Atlantic (NAT) region stakeholders, including State authorities, airspace users and ANSPs.

1.2.3 The NAT SPG also noted that the ANC WG/SRP queried the purpose and process of conformance checking as outlined in Conclusion 51/08 [Conformance checking prior to oceanic entry]. The NAT SPG commented that this was related to the implementation of improved route conformance checking using Automatic Dependent Surveillance – Contract (ADS-C) prior to oceanic entry, combined with controller-pilot data link communications (CPDLC) Uplink Message (UM) 137 (CONFIRM ASSIGNED ROUTE) and Downlink Message (DM) 40 (ASSIGNED ROUTE [route clearance]). For Future Air Navigation System (FANS) 1/A aircraft, this check would mitigate the risk of an aircraft having filed one flight plan but flying a different trajectory. It was noted that the ADS-C-based function was already implemented in the NAT region and the implementation of the fully automated CPDLC-based function was progressing.

1.3 STATUS OF NAT SPG/51 CONCLUSIONS

1.3.1 The ICAO Secretariat presented the NAT SPG with information on the status of the NAT SPG/51 agreed Conclusions. The NAT SPG noted that 18 of the 24 NAT SPG/51 Conclusions had been

closed (1,2,3,4,6,8,9,10,11,12,13,14,15,16,17,18,21,24) and the remaining 6 Conclusions (5,7,19,20,22,23) would be addressed during the current meeting.

1.4 OVERVIEW OF ICAO'S ENVIRONMENT WORK

1.4.1 The NAT SPG was provided with an overview of the environmental benefits generated by the implementation of operational measures in the European (EUR) and North Atlantic (NAT) Regions.

1.4.2 It was noted that part of the results reflected in the presentation had been developed by the ICAO Committee on Environmental Protection (CAEP) and had been approved by the ICAO Council in June 2016 (ICAO Doc 10069 - *Report of the Tenth Meeting of the Committee on Aviation Environmental Protection* and Information Paper (IP)03 presented to the 28th meeting of the North Atlantic Economic, Financial and Forecast Group (NAT EFFG/28, 28-30 April 2015) refer).

1.4.3 The first results presented addressed an analysis showing the environmental benefits resulting from the implementation of Aviation System Block Upgrades (ASBU) Block 0 Modules. Based on the current and planned implementation of the ASBU Block 0 modules, the analysis showed potential average fuel burn savings of between 55 and 107 kilograms (kg) per flight across all ICAO Regions from 2013 to 2018. These savings corresponded to a range of 2.48 to 4.87 megatonnes (Mt) in global annual fuel saving in 2018 when compared to the 2013 baseline. These fuel savings amounted to global carbon dioxide (CO_2) emission savings of 7.8 to 15.4 Mt.

1.4.4 For the ICAO EUR Region the total fuel burn was estimated for 2018 at 80.80 Mt; the fuel burn savings resulting from the current and planned ASBU Block 0 implementation between 2013 and 2018 was estimated to range from 0.61 to 1.23 Mt (0.68 to 1.45 percent of total fuel burn).

1.4.5 For the ICAO NAT Region the total fuel burn was estimated for 2018 at 79.60 Mt; the fuel burn savings resulting from the current and planned ASBU Block 0 implementation between 2013 and 2018 was estimated to range from 0.71 to 1.32 Mt (0.80 to 1.56 percent of the total fuel burn).

1.4.6 Separate from the ICAO/CAEP analysis, Canada and the United Kingdom presented to the NAT EFFG/28 meeting an analysis of benefits from the implementation of RLatSM which was expected to reach a net fuel savings of 1368 tonnes with an associated reduction in CO_2 emissions of 4318 tonnes. In 2018, it was expected to have a net fuel savings of 7651 tonnes with an associated reduction in CO_2 emissions of 24154 tonnes.

2. PROPOSED AIR NAVIGATION SYSTEMS PERFORMANCE MONITORING AND MEASUREMENT

Not addressed at NAT SPG/52.

3. NAT PLANNING AND IMPLEMENTATION MANAGEMENT ISSUES

3.1 IMPLEMENTATION PROGRAMME UPDATES

Interim report of RLatSM Phase 2 Transition Project Team (RLatSM Ph 2 TPT)

3.1.1 The NAT SPG was provided with an interim report of the RLatSM Phase 2 Transition Project Team (RLatSM Ph 2 TPT)), established in follow up to the North Atlantic Implementation Management Group (NAT IMG) Decision 47/16 to address some specific tasks from the Task List Supporting the Trial Implementation of RLatSM in the ICAO NAT Region (RLatSM Task List) in order to facilitate the transition from Phase 1 to Phase 2.

3.1.2 The report included a Table reflecting the success criteria metrics (**Appendix B** refers) aligned to those identified in Section 11 of the Implementation Plan for the Trial Application of RLatSM in the NAT Region (RLatSM Plan) and a breakdown of the combined data gathered by Canada and the United Kingdom for the trial period from 15 December 2015 up to 31 May 2016. The data was intended to support the NAT decision-making process for proceeding to RLatSM Phase 2.

3.1.3 From the data presented it was noted that all success criteria had been met so far and there was no indication that the trial was having any adverse safety impact on the operations. Of the 19000 flights cleared in Shanwick Oceanic Control Area (OCA) on RLatSM tracks as part of Phase 1 of the trial, 22 event reports had been received regarding flights with connectivity issues that required controller action for the maintenance of the required separation. Both Shanwick and Gander OCAs continued to work closely with airspace users with regard to the use of 'confirm assigned route' messages (UM137).

3.1.4 The NAT SPG was informed that an increase in westbound flights with pre-boundary logon issues prior to entry had been reported as occurring since mid-March, resulting in an increased but manageable controller workload. Engineering connection issues were being tracked, and resolutions investigated and actioned through the NAT Data Link Monitoring Agency (DLMA) and North Atlantic Technology and Interoperability Group (NAT TIG).

3.1.5 The NAT SPG noted that the NAT Mathematicians' Working Group's (NAT MWG) assessment of the impact of RLatSM on the collision risk based on 2016 data would be included in the 2017 NAT MWG report next year. This was dependent upon additional data from the NAT Scrutiny Group (NAT SG). An interim assessment based on the first six months of 2016 would be completed before October 2016 after the NAT SG had reviewed the reported safety incidents. It was also noted that based on current statistics, the Project Team considered the trial status as "PASS", noting that there have been no reported incidents related to vertical, longitudinal and lateral errors on the RLatSM tracks.

3.1.6 In this respect, the NAT SPG noted that the target for item "SF1-3" in the Table (**Appendix B** refers) had been worded inadvertently as "Lateral collision risk remains below the TLS". It was recalled that the RLatSM Plan described this target as "Lateral collision risk does not increase". Therefore, the Table was corrected to match the RLatSM Plan agreed definition.

3.1.7 The NAT SPG also noted that a safety assessment of RLatSM Phase 2 related to Task 12 of the RLatSM Task List had been completed. The safety assessment included a detailed analysis of four years of lateral deviation data obtained from the NAT Deviations and Errors Monitoring Application (NAT DEMA)[1]. The safety analysis reviewed the parameters contained in the Reich lateral collision risk model, with a focus on the following three variables specific to RLatSM:

a) an updated lateral overlap probability parameter, $P_y(25)$ derived based on an analysis of the most current four years of reported gross navigation errors (GNE) within the NAT, which considered the reduced lateral separation minima;

b) the core tracks were typically the two busiest adjacent tracks on the NAT Organized Track System (OTS). Historical same direction lateral occupancy values were not available for the core tracks but were available for the OTS. The lateral occupancy values for the OTS were used to derive a more appropriate value for the core tracks. As well, a threshold analysis determined the maximum tolerable lateral occupancy; and

c) an average aircraft size was computed for the core tracks based on 2014 NAT flight data.

[1] *This database, designed on the Microsoft Access® platform, allowed stored information to be queried using multiple possible criteria in order to identify events such as GNEs, large height deviation (LHDs) stored in the database.*

3.1.8 This RLatSM Phase 2 safety assessment involved a comparison of the operational differences between Phase 1 and 2. In addition, the subsequent impact on the collision risk model parameter estimates and resulting collision risk assumed in Phase 1 was examined.

3.1.9 The NAT SPG noted that the revised collision risk estimate of Phase 1 increased slightly to 4.72×10^{-9} fatal accidents per flight hour (fapfh), but remained below the lateral Target Level of Safety (TLS) of 5×10^{-9} fapfh. In this respect, the NAT SPG commented that this increased estimate did not match with the definition of the SF1-3 success criteria set by the RLatSM Plan and by the table in **Appendix B** that the lateral risk would not increase (paragraph 3.1.6 above refers). It was agreed that the Project Team would need to further examine this discrepancy and report back. Furthermore, it was noted that a review of the collision risk parameters and lateral error rates used in the updated Phase 1 assessment indicated that they would also apply to Phase 2 and, therefore, the lateral collision risk estimate for Phase 2 was also expected to be below the lateral TLS.

3.1.10 In view of the above, the NAT SPG agreed that the commencement date of Phase 2 would be 10 November 2016 (NAT IMG Decision 48/01 refers), pending an expected positive outcome of the NAT MWG, NAT SG and North Atlantic Procedures and Operations Group (NAT POG) work based on further data to be collected by the RLatSM Ph 2 TPT in autumn 2016. Should the further reports indicate any adverse impact on the operations, the decision of the commencement date of Phase 2 would be revisited by correspondence in coordination with the NAT SPG, NAT IMG and North Atlantic Safety Oversight Group (NAT SOG).

3.1.11 The NAT SPG was also provided with a draft common language Aeronautical Information Circular (AIC) (**Appendix C** refers) to respond to Task 21 from the RLatSM Task List (Advance notice to User States and Operators) and an update to the RLatSM NAT Operational (NAT OPS) Bulletin 2015_003 (Rev1)) responding to Task 24 from the RLatSM Task List (**Appendix D** refers).

3.1.12 In view of the above, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/01 - Transition to Phase 2 of the NAT Implementation Plan for the trial application of RLatSM

That the ICAO Regional Director, Europe and North Atlantic:

a) invite the concerned NAT provider States to promulgate a common language Aeronautical Information Circular (AIC) as presented at **Appendix C** to the NAT SPG/52 Report at least two AIRAC cycles prior to the agreed RLatSM Phase 2 commencement on 10 November 2016; and

b) publish the amended NAT RLatSM Ops Bulletin provided in **Appendix D** to the NAT SPG/52 Report.

Volcanic Ash Exercises - EUR (EAST) – VOLKAM

3.1.13 The NAT SPG noted that the Volcanic Ash Exercises Steering Group for the (far) Eastern part of the EUR Region (EUR (EAST) VOLCEX/SG) planned and conducted a volcanic ash exercise called VOLKAM16 that simulated a volcano eruption of Karpinsky (Northern Kurile Islands) from 2200 UTC on 21 April 2016 to 0130 UTC on 22 April 2016. One volcanic ash plume with height to flight level (FL) 400 moved to the southeast impacting trans-east and Northern Pacific (NOPAC) routes. The other plume with height to FL 200 moved to the northeast in order to test the Volcanic Ash Advisory Centre (VAAC) Tokyo to VAAC Anchorage handover on their border at 60N.

3.1.14 The five objectives of this exercise were met. The first objective demonstrated coordination procedures between all participating parties. Specifically, volcanic ash information flow occurred in accordance with Annex 3 and 15 provisions; Area Control Centre (ACC) coordination was conducted for contingency routing, transferring of flights, adjusting Track 1 of the Pacific Organized Track System

(PACOTS); and the Main Air Traffic Management Centre (MATMC) Moscow coordination with Russian ACCs in the eastern part of the Russian Federation in that re-routes were reviewed and accepted into Russian Federation airspace.

3.1.15 The second objective demonstrated tactical re-routes, which was done between six airlines and seven ACCs serving seven Flight Information Regions (FIR); noting that a majority of re-routes would not require an unplanned stop for fuel. In addition, some aircraft, depending on performance and fuel availability, overflew the ash cloud that moved north with height to FL 200.

3.1.16 The third objective demonstrated VAAC Tokyo's handover to VAAC Anchorage for their common border at 60N. The fourth objective demonstrated the transmission of special air-reports as per Annex 3 provisions with one such report received by voice communication from the pilot to the ACC. The fifth objective demonstrated information sharing via two teleconference calls.

3.1.17 The NAT SPG noted that eight recommendations had been developed at the VOLKAM16 Debrief meeting (Paris, 11 May 2016). Those relating to routing around the volcanic ash included standardized re-route requests; coordination procedures in Exercise Letter of Agreement (LoA) on contingency routes; and procedures to publish ad-hoc traffic management initiatives in a volcanic ash event.

3.1.18 The VOLKAM17 planning meeting would take place from 8 to 10 August 2016 in Kamchatka to determine the exercise scenario for VOLKAM17 taking into consideration the recommendations from VOLKAM16.

Volcanic Ash Exercises - EUR/NAT – VOLCEX

3.1.19 The European and North Atlantic Volcanic Ash Exercises Steering Group (EUR/NAT VOLCEX/SG) conducted the VOLCEX16 planning meeting from 8 to 9 December 2015 in Paris. The draft Exercise Directive contained details related to this exercise that would simulate a volcano eruption of Bárðarbunga in Iceland from 11 to 12 October 2016 from 0800 to 1600 UTC on both days. The volcanic ash plume was expected to spread over a large part of northwest Europe and extend to the Baltic Sea region by the end of the second day. The continuous eruption would impact the northwest part of Europe on the second day as well.

3.1.20 Supplementary information would be available in the form of concentration charts on Day 1 in order to test the current Safety Risk Assessment (SRA) process. These charts would be provided for the following layers: below FL 200, between FL 200 and FL 350, and between FL 350 and FL 550.

3.1.21 Supplementary information would be available in the form of volcanic ash (VA) contamination charts using a column mass loading based approach on Day 2 in order to test the proposed new products. These charts would provide a top and bottom (where available) level estimate of the first threshold and would represent a snapshot for the time provided. These products would be issued every 6 hours with intervals of 3 hours. Observations would be used to update these products up to 6 hours (T+0, T+3 and T+6) since updating all the charts would be too labour intensive and updating the first 6 hours would satisfy information needed for tactical decision making. Concentration charts would be made available for Day 2 in an Appendix to the VOLCEX16 Directives in order for the operators to compare the two products.

3.1.22 The objectives of VOLCEX16 developed at the planning meeting included the following:

a) Exercise the merged EUR/NAT Volcanic Ash Contingency Plan (EUR Doc 019, NAT Doc 006, Part II);

   i. For individual States: test the effectiveness of their national procedures in accordance with the ICAO Plan;

   ii. For all participants: test the effectiveness of local (organizational) volcanic ash contingency plans and/or procedures;

iii. Exercise the origination, dissemination, reception and use of volcanic ash related aeronautical/meteorological information (including VAA (Volcanic Ash Advisories)/VAG (Volcanic Ash Graphics), VA concentration charts – Day 1 and column mass loading charts and data – Day 2, VA SIGMET (SIGnificant METeorological Information) and NOTAM (Notice To Airmen) as well as special air-reports of volcanic activity) – and ensure that NOTAMs are in accordance with the ICAO EUR/NAT Volcanic Ash Contingency Plan; and

iv. Evaluate the utility of VA threshold (column mass loading methodology) charts and data;

b) Exercise and evaluate crisis coordination between the various stakeholders through the EACCC (the European Aviation Crisis Coordination Cell) and the Aircraft Operator Crisis Coordination Cell (AOCCC);

c) Test the air traffic management (ATM) responsiveness to need of aircraft operator (AO) operational flexibility;

d) Test the dissemination of special air-reports on volcanic ash for display on the Network Manager (NM) Network Operations Portal (NOP) / EVITA Tool (European Crisis Visualisation Interactive Tool for ATFCM); and

e) Conduct table-top exercise on comparison of current concentration charts and proposed column mass loading charts (10 June 2016, participants to include approximately 6 airlines (a balance of large carriers, regional and one from outside the region) as well as Civil Aviation Authorities (CAA), VAACs London and Toulouse, Eurocontrol and ICAO). Results to be reported to the 66th meeting of the European Air Navigation Planning Group (EANPG) Programme Coordinating Group (COG) (EANPG COG/66, 10-14 October 2016).

3.1.23 The NAT SPG noted that the participants of the table-top exercise learned about the differences between concentration charts and the proposed column mass loading charts. The following testing and implementation plan related to the proposed mass loading products was developed:

a) Test the proposed column mass loading products on Day 2 of the Exercise (12 October 2016) using the concentration charts as reference only;

b) Provide input on the proposed column mass loading products in comparison with the concentration charts at the VOLCEX16 debriefing (Reykjavik, 15 November 2016);

c) Provide results of VOLCEX16 debriefing – particularly results related to proposed column mass loading products as viewed by the operators and other stakeholders to the EANPG/57 meeting (Paris, 28 November – 1 December 2016);

i. Depending on the results, request EANPG to endorse proposed column mass loading products and request a survey to States whether or not their CAA would accept an SRA based on these new products;

d) Result of survey on CAA acceptance of SRA based on proposed column mass loading products conveyed to the European Aviation Safety Agency (EASA) as well as endorsement by operators participating in VOLCEX16 (by end of first quarter 2017);

e) Coordinate with EASA on best approach to change the Safety Information Bulletin (SIB) related to volcanic ash (date to be determined (TBD));

i. EASA conducts impact to safety in coordination with engine manufacturing experts on proposed column mass loading products (date TBD); and

ii. Based on results, determine implementation date (date TBD – not expected before 2018).

3.1.24 The VOLCEX16 debrief meeting would take place on 15 November 2016 in Reykjavik, Iceland. The VOLCEX17 planning meeting would take place the following day at the same location.

3.2 PERFORMANCE MONITORING

NAT Data Link Performance Report

3.2.1 The NAT SPG was provided with the *NAT data link performance report for 2015* as produced by the NAT TIG using the regular reports from the NAT Data Link Monitoring Agency (NAT DLMA) and NAT air traffic service providers (ATSPs). The NAT SPG noted that the NAT data link performance in 2015 met the requirements established by NAT SPG Conclusions 48/07 and 49/05 (*on applicability of required communication performance (RCP) 240 and required surveillance performance (RSP) 180 related to 25 NM lateral separation minimum (RLatSM) and 5 min longitudinal separation minimum (RlongSM) implementations*).

3.2.2 In view of the above, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/02 – NAT Data Link Performance Report 2015

That the ICAO Regional Director, Europe and North Atlantic, take appropriate actions to publish the *NAT Data Link Performance Report for 2015* as provided at **Appendix E** to the NAT SPG/52 Report.

NAT voice communications issues

3.2.3 The NAT SPG noted the *2015 NAT Voice Communications Traffic Consolidated Report*. The report identified that the total amount of messages using high frequency (HF), general purpose (GP) very high frequency (VHF) and satellite voice communications (SATVOICE) media contacts for the aeronautical radio communications stations during 2015 was 3167381. Their distribution was as follows: 72.3% by HF, 27.5% by VHF and 0.2 % on SATVOICE. The percentage of traffic for each station was as follows: Canada (27%), Ireland and Iceland (51%), Portugal (10%), the United States (11%) and Norway (2%). The report showed an increase of 2.9% compared to 2014 in the volume of air-ground messages.

Incorrect flight plan filing

3.2.4 The NAT SPG noted the data link performance report that included data on the CPDLC, ADS-C, RNP 4 and Automatic Dependent Surveillance – Broadcast (ADS-B) capability as filed in the flight plan and their actual usage, divided by organised track (OTS), non-OTS traffic and per operator. The report indicated a steady increase in FANS 1/A CPDLC/ADS-C, Required Navigation Perfomance (RNP) 4 and ADS-B equipage and an increase in their usage during 2015.

3.2.5 The statistics also identified inconsistencies between the flight plan filed equipage and the actual equipage or its usage. The NAT SPG recalled that incorrect filing of equipage in the flight plan appeared to be a persistent issue and, despite a number of previously undertaken informal actions, it continued to occur. The NAT SPG noted that based on the flight planned equipage, the air traffic service (ATS) units would determine the operational service to be provided, hence, incorrect filing of flight plans could result in operational issues. Therefore, the NAT SPG agreed that a more formal action at the level of the State CAAs would be required. IBAC commented that they would also be ready to assist in channeling the above identified issue to the general aviation (IGA) community. For this purpose, it was agreed that updated information should be provided to the next meeting to include IGA operators.

3.2.6 In view of the above, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/03 – Incorrect filing of equipage in the flight plan

That the ICAO Regional Director, Europe and North Atlantic, invite the NAT user States to follow up with the aircraft operators that are identified as incorrectly filing the equipage in the flight plan as provided at Appendix F to the NAT SPG/52 Report.

Analysis of problem reports

3.2.7 The NAT SPG was provided with a table listing data link problem reports (PRs) for which avionics fixes were available (or would soon be available) but that were not necessarily installed on all aircraft. The NAT SPG agreed that action was required to encourage the NAT airspace users to upgrade their aircraft systems as soon as possible with the avionics fixes listed in the table in order to improve data link performance. The NAT SPG noted that implementation of some of the fixes would entail costs for aircraft operators. However, the benefits that could be attained through the application of data link-enabled air traffic services would outweigh the costs incurred. In this respect, the NAT SPG also noted that implementing the above mentioned fixes could be considered as one of the conditions for Performance-Based Communication and Surveillance (PBCS) approvals. Therefore, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/04 – Implementation of available data link problems fixes by aircraft operators

That the ICAO Regional Director, Europe and North Atlantic, invite the NAT user States to follow up with aircraft operators operating in the NAT Region to encourage implementation of the available fixes to the data link performance problems as provided at **Appendix G** to the NAT SPG/52 Report.

NAT Data Link Mandate Phase 2

3.2.8 The NAT SPG was presented with proposed amendments to NAT SPG Conclusion 49/11 [NAT Region Data Link Mandate (DLM) Phase 2] and the subsequent NAT DLM implementation policy for Phase 2.

3.2.9 The NAT SPG recalled that one of the principles behind the NAT DLM was that it would not be applicable in areas where ATS surveillance services and VHF voice communications were provided. The *NAT ATMG/40 Summary of Discussions* (Brest, September 2012) specified that the recommendation on the boundaries for ATS surveillance service areas was predicated on the availability of both radar/ADS-B and very high frequency (VHF) voice communications. However, due to the possible assumption of what ATS surveillance services commonly entailed, the requirement for VHF voice communications was not specifically inserted into the NAT SPG/49 agreed policy and recommended text for the common NAT AIC.

3.2.10 The NAT SPG noted that in the current environment the omission of VHF voice communications from the definition did not have any practical consequence as the coverage areas of the ATS surveillance (radar and/or ADS-B) and VHF voice communications services were essentially the same (NAT DLM AIC Canada refers). However, with the expected advent of Space-Based ADS-B (SB ADS-B) enabled services in 2018, the entire NAT Region would potentially become ATS surveillance airspace. As the policy was written, this would lead to a potential misunderstanding of the expected airspace requirements in terms of aircraft equipage with potential safety implications.

3.2.11 The NAT SPG agreed that it was in the best interest of NAT stakeholders to amend the NAT DLM Phase 2 policy and the common AICs to specify what was originally intended: to exempt areas where radar/ADS-B and VHF voice communications were provided.

3.2.12 Therefore, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/05 – Amendments to NAT DLM Phase 2 policy and guidance for State AIP/AIC publications

That:

a) the amendments to NAT SPG Conclusion 49/11 and guidance for State Aeronautical Information Publication (AIP)/Aeronautical Information Circular (AIC) publications on NAT Data Link Mandate (DLM) Phase 2 implementation shown in **Appendix H** and **Appendix I** to the NAT SPG/52 Report be endorsed;

b) the NAT provider States coordinate the development of a document to support a publication of a harmonised Aeronautical Information Publication (AIP)/Aeronautical Information Circular (AIC) based on the guidance provided in **Appendix I** to the NAT SPG/52 Report; and

c) the ICAO Regional Director, Europe and North Atlantic, amend and publish the NAT Operational (NAT OPS) Bulletin on the NAT Data Link Mandate on the ICAO EUR/NAT website.

NAT Data Link Mandate Phase 2 (Tango routes)

3.2.13 Furthermore, the NAT SPG discussed the expected impact of Phase 2b of the NAT DLM (effective from 7 December 2017) on flights operating on the "Tango routes" in the southeast corner of the Shanwick OCA. It was noted the indications that the FANS 1/A equipage level for aircraft operating in the southeast corner of the Shanwick OCA (including the "Tango routes") was significantly lower than the average in the NAT region. In most cases, the aircraft utilising these routes were probably equipped to comply with the European Datalink Implementation Rule based on ATN/VDL2 (Aeronautical Telecommunication Network/VHF Digital Link Mode 2), as these aircraft would mostly operate in the EUR airspace. However, it was noted that ATN/VDL2 equipage would have no value for operations on the Tango routes as they were mostly outside of VHF coverage areas. It was noted that with the implementation of Phase 2b of the NAT DLM, non-FANS 1/A aircraft would not be able to operate on the Tango routes between FL 350 and 390.

3.2.14 The NAT SPG noted the importance and complexity of this area at the interface with the European route network due to the constantly growing demand to operate and specifically in contingency situations when some adjacent airspace volumes could be closed due to various reasons. However, it was emphasised that Phase 2b concerned the expansion of the area of the NAT DLM applicability beyond the NAT OTS to the whole NAT High Level Airspace (NAT HLA) and therefore FANS 1/A equipage requirements would not be limited to airspace users that operated on the Tango routes only and the interests of the whole NAT airspace users community needed to be taken into account.

3.2.15 The NAT SPG recalled that the NAT DLM implementation plan and policies had been coordinated extensively through the NAT SPG structure with participation of all stakeholders since 2009. The related *NAT Regional Supplementary Procedures* (NAT SUPPS, Doc 7030) amendment went through a global ICAO consultation process involving all NAT User States and had been approved by the ICAO Council. The NAT SPG felt it was unfortunate that the concerns of some airspace users pertaining to the implementation of Phase 2b in December 2017 were only now brought to the attention of the NAT groups. It was noted that significant investments had been made by the NAT airspace users and ANSPs to comply with the NAT DLM provisions, including the implementation of additional ground-based ADS-B/VHF voice systems providing corridors to cater for DLM exemption rules.

3.2.16 The NAT SPG recalled that the prime objective of the NAT DLM was to improve the safety level and achieve/exceed the NAT agreed safety targets. The NAT DLM based on FANS 1/A CPDLC and ADS-C was identified as the only solution available that could enable achievement of these safety targets. Other solutions could emerge in the future that could provide alternative solutions to enable meeting the NAT safety objectives. When these solutions would become available and their potential applicability standardised through ICAO, their implementation would be coordinated through the ICAO NAT SPG mechanisms.

3.2.17 Until that time, FANS 1/A was the only solution available that would enable CPDLC and ADS-C (including conformance monitoring) in the areas outside of VHF coverage and meet the standards and requirements (RTCA DO-258, RTCA DO-306 and NAT SUPPs, Doc 7030 provisions refer).

3.2.18 The NAT SPG noted that, in view of the increasing demand of operations on Tango routes and concurrent with the NAT objective to meet continuously the NAT safety targets, maintaining the status quo and not implementing Phase 2b of the NAT DLM on Tango routes could be achieved only at the cost of

ATS restrictions such as access to requested flight levels, separation minima applied, etc. Any potential solution, either NAT DLM or any future solution, would come at a certain cost.

3.2.19 In this respect, the NAT SPG noted that the NAT IMG had established a specific Southeast Corner Routes Project Team (NAT IMG SCRPT), (Project Definition attached at **Appendix J)**, tasked to analyse the potential impact of the NAT DLM Phase 2b on aircraft operating on the Tango routes, identify possible solutions and provide a report to NAT IMG/49 (November 2016).

3.2.20 It was noted that one potential solution would allow for a temporary derogation from compliance with the NAT DLM Phase 2b for operations on Tango routes. It was noted, that if such a solution would be proposed, it should clearly identify the conditions under which this derogation would be applied and the validity timelines. The safety argument would need to be closely analysed in coordination with the NAT SOG to ensure that the safety objectives for operations on the Tango routes and in the NAT region in general continued to be met.

3.2.21 It was pointed out that aircraft similarly equipped as those using the Tango routes were also employed in other parts of the NAT Region not served by ATS surveillance and VHF communications and thus not exempted from the NAT DLM. The operators of such aircraft (in some cases, the same operators as those who use the Tango routes) might claim that the derogation should also apply to these operations. The final NAT-agreed solution would need to take account of this consideration and the implications for the future of the data link mandate in the whole NAT Region.

3.2.22 The NAT SPG agreed that the Project Team should continue its work and produce, in coordination with the NAT SOG and NAT IMG, a final report to NAT IMG/49. The outcome would thereafter be coordinated with the NAT SPG members by correspondence before the end of 2016.

3.2.23 In view of the discussions, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/06 – NAT DLM and the impact on the "Tango route" Operations

That,

a) The work of the NAT IMG Southeast Corner Routes Project Team (NAT IMG SCRPT) is supported;

b) The NAT IMG SCRPT, in coordination with the NAT IMG and NAT SOG, is invited to identify all potential solutions to the reported operational issues raised by the Data Link Mandate implementation in the Southeast corner of the NAT Region, including taking into account all the potential effects on safety;

c) The NAT IMG SCRPT finalise its work in time to report the outcome to the NAT IMG/49 (November 2016) and NAT SOG/15 (December 2016) for further consideration; and

d) NAT SPG approval of the proposed agreed solution be sought by correspondence, before the end of December 2016.

4. NAT OPERATIONAL AND SAFETY IMPROVEMENTS

4.1 JOINT CONOPS SUPPORTING SPACE-BASED ADS-B IMPLEMENTATION

4.1.1 In follow up to NAT SPG Conclusion 50/07 [Space-Based ADS-B Initiative], the NAT SPG was provided by Canada and the United Kingdom with a joint Concept of Operations (CONOPS) supporting the initial implementation of Space-Based ADS-B (SB ADS-B) services in the Gander and Shanwick OCAs.

4.1.2 The NAT SPG noted that the joint CONOPS supported the introduction of the "surveillance-enabled separation", referring to the procedural minima currently being developed by the Separation and Airspace Safety Panel (SASP) that would depend upon ATS surveillance for position information. It was

noted that it was the intention of Canada and the United Kingdom to apply these minima on a trial basis beginning in February 2018, pending full global applicability. The procedures and application would be in accordance with the SASP's proposed amendment to the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444) and their supporting draft Circular. The new minima and other changes to the services provided would be introduced in a phased manner.

4.1.3 The NAT SPG was informed that the joint CONOPS was developed only for the Gander and Shanwick OCAs, due to the highly integrated nature of their operations, including both oceanic area control centres using the same flight data processing system. As well, both ANSPs planned to use space-based ADS-B to enable ATS surveillance coverage throughout the NAT Region portions of airspace where they provided services.

4.1.4 The NAT SPG noted that the joint CONOPS listed the following operating assumptions around the implementation of services using space-based ADS-B in the Gander and Shanwick OCAs:

a) Adjacent domestic air navigation service providers (ANSPs) would undertake necessary enhancements to assure sufficient service quality for aircraft operating across the oceanic/domestic interface;

b) If segregation of airspace between equipped and non-equipped ADS-B aircraft would be determined necessary, an appropriate *NAT Regional Supplementary Procedures* (NAT SUPPs, Doc 7030) amendment would be done. (Note: currently, there was no such segregation);

c) The practice of ensuring conflict-free profiles as applied to operations within the Gander and Shanwick OCAs would continue;

d) The requirement to obtain an oceanic clearance prior to entering the Gander or Shanwick OCA would remain in place for all aircraft;

e) ADS-C conformance monitoring would remain in place; i.e. vertical and lateral deviation contracts would be set up between aircraft equipped with FANS 1/A or equivalent. ADS-C periodic contracts would not be established with ADS-B aircraft;

f) The NAT OTS would remain in use, although its geographic "footprint" could be reduced;

g) ADS-B and non-ADS-B flights would operate in the same airspace; i.e. mixed-mode operations;

h) An ADS-B aircraft would be considered an aircraft equipped with ADS-B and expected to be surveillance identified while operating in the Gander or Shanwick OCA;

i) Reduced separations would be applied between surveillance-identified aircraft operating within and transiting between the Gander and Shanwick OCAs and between these OCAs and adjacent domestic FIRs;

j) Reduced separation minima would be applied in accordance with material developed by the SASP on a trial basis pending its incorporation into the *Procedures for Air Navigation Services - Air Traffic Management* (PANS-ATM, Doc 4444).

4.1.5 The NAT SPG provided comments with regard to the contents of the CONOPS. In particular, it was noted that with regard to e) above, NAT IMG/48 felt that the implications of the assumption that ADS-C periodic reports would not be established with ADS-B aircraft could need further careful examination in respect of connection continuity checks, as well as route conformance monitoring through regular reports of the predicted route, e.g. in waypoint change event reports.

4.1.6 In this respect, the NAT SPG noted that NAT SPG Conclusion 50/07 was designed to support the expanded use of ATS surveillance in the whole ICAO NAT Region. Also, NAT IMG Decision 47/05 established a NAT Space Based ADS-B Project Team (SB ADS-B PT) with the outcomes to deliver a NAT safety plan, NAT CONOPS and NAT business case. While acknowledging the benefits of the initial

focus of the CONOPS on the Gander and Shanwick areas, the NAT SPG underlined that the future work should encompass the whole of the NAT Region. Therefore, the NAT SPG agreed that the CONOPS would be provided to the NAT SB ADS-B PT for further review in line with its Terms of Reference (ToRs).

4.2 REVIEW OF CURRENT OCEANIC CONTINGENCY PROCEDURES IN A REDUCED LATERAL SEPARATION ENVIRONMENT AND UNDER CERTAIN METEOROLOGICAL CONDITIONS

4.2.1 IATA presented the NAT SPG with a paper highlighting the concerns of their member airlines with respect to the current PANS-ATM (Doc 4444) contingency procedures which allowed a 180-degree turn back with an engine out (in a 2 engine aircraft) without an air traffic control (ATC) clearance in a reduced lateral separation environment. It was noted that this manoeuvre under certain meteorological conditions could conflict with traffic on an adjacent track, laterally and vertically, creating a potential flight operation safety risk.

4.2.2 The NAT SPG noted that the contingency procedures applicable in the NAT Region were covered in the PANS-ATM (Doc 4444), NAT SUPPs (Doc 7030), *North Atlantic Operations and Airspace Manual* (NAT Doc 007), and the NAT OPS Bulletin 2015_003 RLatSM Special Emphasis Items Revision 1.

4.2.3 The NAT SPG also noted the data presented demonstrated that diversions in the NAT Region had increased constantly in the last 4 years and on average occurred nearly every other day. The NAT SPG noted that attempts to acquire an ATC clearance prior to leaving a track depended on how urgent the necessity was to divert. An unexpected engine loss, rapid depressurization or smoke and fire scenario would significantly consume flight crews' time, notwithstanding the need for safe operation of the aircraft, navigation, and completion of crucial checklists. Additionally, it could take as much as 5 minutes to initiate a voice call on HF. It was noted that due to the above mentioned concerns, some operators had decided, for safety reasons, not to manoeuvre (turn back) above FL 290 without an ATC clearance.

4.2.4 In this respect, the NAT SPG commented that ADS-C equipage was mandatory for operations on half-degree tracks and its conformance monitoring function would automatically inform the ATS unit (ATSU) about commencement of a diversion. It was felt that the potential use of such automated tools in order to mitigate risk would need further exploration. The NAT SPG also noted that the implications of the above mentioned procedures would not only be limited to RLatSM but would also apply to any other reduced lateral separation. However, it was also highlighted that the implications on the NAT OTS with RLatSM would probably be more salient than in other areas in the NAT Region.

4.2.5 The NAT SPG was informed that the SASP had been tasked to review the contingency procedures in the PANS-ATM (Doc 4444) in regard to reduced lateral separation and specifically space-based ADS-B, with a submission timeline to accommodate publishing the revised PANS-ATM (Doc 4444) by November 2018.

4.2.6 Having noted that there was a gap between the expected PANS-ATM (Doc 4444) amendment date and the planned implementation of RLatSM phase 2, the NAT SPG agreed to task its contributory groups to examine operator-modified contingency procedures and make recommendations regarding these procedures and the safety impact in a reduce lateral separation environment and/or while under certain meteorological and aircraft conditions. The NAT SPG recalled that the *North Atlantic Operations and Airspace Manual* (NAT Doc 007) already included special provisions advising crews, when unable to maintain altitude, to initially minimise rate of descent when leaving its original track centre line and then, when expected to be clear of any possible traffic, expedite descent. Some aircraft may not want to expedite descent due to certain meteorological conditions (inability to de-ice the cowl of the inoperative engine).

4.2.7 Accordingly, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/07 – Review of current oceanic contingency procedures in a reduce lateral separation environment and under certain meteorological conditions

That, the NAT IMG:

a) undertake a further analysis to examine potential safety and operational impact of the current ICAO contingency procedures in a reduced lateral separation environment;

b) determine, in full recognition of the work and timeline of the SASP, the applicability and need for modified contingency procedures in the NAT Region, as it relates to the introduction of RLatSM Phase 2 (November 2016) and under certain meteorological and aircraft conditions (i.e., overshooting cross-wind, engine out, turn back, no ATC clearance); and

c) identify communication mechanisms (i.e., revised State AIC - RLatSM Phase 2, NAT OPS Bulletin) to promulgate the NAT SPG decision concerning contingency procedures to facilitate an appropriate lead time for operator notification and subsequent flight training, if required.

4.3 ELECTRONIC ENVIRONMENT EN-ROUTE AIR TRAFFIC ORGANISER (ERATO)

4.3.1 The NAT SPG was updated on the modernization process of the French ATC systems, which intended to put into service in every French ACC a new ATM system called “4-flight”, planned for winter 2018. A system called “EEE” (Electronic Environment ERATO) consisting of a stripless Human Machine Interface (HMI) associated with a set of modern tools, called “ERATO” (En-route Air Traffic Organiser), was scheduled for implementation by the end of 2015.

4.3.2 The RLatSM implementation trial, planned on AIRAC (Aeronautical Information Regulation and Control) 12 November 2015, had to be synchronized between Shanwick OAC, Gander OAC and Brest ACC, and required the creation of new half-degree exchange points, a new airspace organization and coincided with the high workload period before the beginning of EEE implementation. In addition a technical issue with the processing of Oceanic Clearance Messages (OCM) required a procedural workaround agreed between Brest and Shanwick, until the issue could be fixed by 1 February 2016.

4.3.3 It was noted that in order to reduce the number of vertical error occurrences, a new functionality (OCL alarm) was developed targeting at the discrepancies between OCL (Obstacle Clearance Limit) and AFL (Aircraft Flight Level). Since January 2016 no LHD (Large Height Deviation) had been reported to the NAT CMA at the Brest-Shanwick interface for westbound traffic.

4.3.4 Unfortunately, the necessary implementation of traffic regulations to deal with this major change generated significant delays for aircraft operators. It was reported that the nominal capacity was recovered by 25 May 2016, 6 months after the initial implementation, and that a 5 percent extra capacity had since been achieved for the western control sector clusters, as a milestone to the 15 percent increase expected for the entire Brest ACC airspace. The EEE would allow the French Direction des Services de la Navigation Aérienne (DSNA) to offer a high quality service at the crossroads of major holiday traffic flows between Spain, the Canary Islands and northern Europe, improving both safety and capacity to eventually deliver higher economic efficiency for its customers.

4.4 IMPLEMENTATION OF THE ADS-C CDP IN THE NEW YORK OCEANIC EAST FIR

4.4.1 The NAT SPG was provided with information on the implementation of the Automatic Dependent Surveillance – Contract Climb and Descend Procedure (ADS-C CDP) in the New York Oceanic East FIR in accordance with the newly amended procedures in PANS-ATM (Doc 4444) related to performance-based longitudinal and lateral separation minima and the ADS-C CDP for aircraft in the en-route phase of flight.

4.4.2 It was noted that NAT IMG/48 had been provided with information on the plan for implementation of the ADS-C CDP in the New York Oceanic East FIR and a copy of the Safety Risk Management Document for review. The NAT SPG recalled that the ADS-C CDP was an additional capability fully compatible with the existing United States (US) Federal Aviation Administration (FAA) Advanced Technologies and Oceanic Procedures (ATOP) oceanic automation system. It was noted that software to automate this process had been developed and delivered to all three FAA oceanic facilities. The NAT SPG noted that following local testing and controller training, the FAA expected operational use to commence in the late second to early third quarter of 2016.

5. SAFETY MONITORING

5.1 OUTCOME OF NAT SOG CONTRIBUTORY BODIES

Review outcome of NAT SG/12 meeting

5.1.1 The NAT SPG noted that the NAT SOG was presented with a detailed briefing concerning the 14th meeting of the North Atlantic Scrutiny Group (NAT SG/14) which took place in Miami, United States from 7 to 10 March 2016.

5.1.2 The NAT SPG noted the NAT SG's conclusion that there was continued evidence of misunderstanding and misapplication by crews concerning conditional clearances, particularly involving operators whose first language is other than English (*NAT Central Monitoring Agency (NAT CMA) Report* refers). The NAT SPG noted that the NAT SOG agreed it would be appropriate to ask the NAT IMG to verify within its working structure which technical solutions, including Space-Based ADS-B, ADS-B and radar usage, could be utilized to collect information regarding proper utilization of Selected Flight Level–Cleared Flight Level (SFL-CFL) conformance checking.

5.1.3 The NAT SPG recalled that the Oceanic Errors Safety Bulletin (OESB) was also intended for distribution to industry and training centres and was posted on various websites and noted the NAT SG's proposal to restructure it and to produce more frequent editions with the aim of improving readability and encouraging more stakeholders to review and act on the information contained in the bulletin. In this regard, the NAT SG proposed to include a new "safety highlights" section to emphasize the particularly prevalent/persistent types of errors occurring in the NAT region, such as those identified in paragraph 4.10 of the *NAT SOG/14 Summary of Discussions* (Paris, June 2016), as well as offering best practices to reduce the number of these events. The NAT SPG noted that the NAT SG was tasked to develop recommendations on the restructuring of the OESB and to present the outcome at the next NAT SOG meeting.

Central Monitoring Agency (CMA) Report

5.1.4 The NAT SPG noted that the NAT SOG was presented with the report of activities provided by the North Atlantic Central Monitoring Agency (NAT CMA).

5.1.5 The NAT SPG took note that the current Manager of the NAT CMA intended to retire at an unspecified date in 2017 (a formal notification was expected when the exact date would be known). Any change was intended to be preceded by a period of part-time work for a period of 6 to 12 months during which a replacement could be selected and trained. The NAT SPG noted that the NAT SOG agreed with the proposal that the current rapporteur would stand down at NAT SG/16 in February 2017 (at which meeting the new rapporteur should be inducted).

North Atlantic Mathematicians' Working Group Report (NAT MWG/52)

5.1.6 The NAT SPG noted the NAT SOG was presented with a detailed briefing concerning the 52nd meeting of the Mathematicians' Working Group (NAT MWG/52) which took place in Ottawa, Canada from 11 to 15 April 2016.

5.1.7 The NAT SPG noted the work done by the NAT MWG upon a request from the NAT POG pertaining to the assessment of the impact of RLatSM Phase 1 on the vertical, longitudinal and lateral collision risk, respectively. The NAT SPG noted that attributing the impact of RLatSM to vertical risk would require knowledge of whether or not the reduced lateral separation minima contributed to the occurrence of an LHD event. The NAT SPG noted that the NAT SOG tasked the NAT SG to ensure each vertical error would be scrutinized to determine and record whether the application of reduced lateral separation minima contributed to the occurrence of an LHD event and that it should be indicated in the NAT DEMA.

5.1.8 The NAT SPG noted that the NAT SOG reviewed and agreed with the NAT MWG proposed modification to the current NAT MWG methodology for the treatment of lateral deviation and GNE reports in calculating the lateral collision risk estimates:

a) To eliminate the use of weight factors;

b) To account for risk due to time spent on an incorrect track as well as the number of un-cleared tracks crossed;

c) To include risk bearing GNEs reported via ADS-C position data in addition to those identified within the current monitoring windows; and

d) To revise the "buffer" surrounding the un-cleared track within which a deviating aircraft would be considered risk bearing.

5.1.9 Hence, the NAT SPG noted that the NAT SOG agreed to task NAT SG to capture the information on the time spent by the aircraft on an incorrect track.

5.1.10 The NAT SPG recalled that previously the collision risk estimates calculation utilized only the Gander and Shanwick occupancies. In this regard, the NAT SPG welcomed the fact that in 2015 the lateral and vertical occupancies were derived for all five OCAs; being the second year in which 365 days of flight activity data was available for Gander, Shanwick and New York Oceanic East; and the first year for the Santa Maria and Reykjavik OCAs. The NAT SPG noted that the NAT SOG agreed with the proposal from the NAT MWG to enhance the method for assessing vertical collision risk using all of the available flight activity data for calendar year 2015. The revised method would maintain the existing processes for assessing vertical collision risk within the Gander and Shanwick OCAs (the Middle zone), but it would also consider the flight activity data from the Reykjavik OCA (the North zone), and the New York Oceanic East and Santa Maria OCAs (the South zone) in deriving occupancies (and a collision risk) for their respective zones.

5.1.11 The NAT SPG also noted the request from the NAT MWG to extend its participation to other NAT States – Iceland and Portugal, and possibly to other NAT groups such as the NAT SG and to industry associations such as IATA and IFALPA. The NAT SPG noted that it was agreed that Iceland and Portugal would investigate opportunities to nominate relevant experts to participate in the NAT MWG.

5.2 NAT 2015 ANNUAL SAFETY REPORT (ASR)

5.2.1 The NAT SPG was presented with the *Draft 2015 Annual Safety Report (ASR)* as reviewed and approved by NAT SOG/14. The NAT SPG endorsed the document and agreed to the following:

NAT SPG Conclusion 52/08 – NAT 2015 Annual Safety Report (ASR)

That:

a) the *NAT 2015 Annual Safety Report* (ASR) as presented in **Appendix K** to the NAT SPG/52 Report be endorsed;

b) the ICAO Regional Director, Europe and North Atlantic, take appropriate action to publish the *NAT 2015 Annual Safety Report*.

6. NAT DOCUMENTATION

6.1 PROGRESS ON THE NAT EANP

Update on NAT eANP Volumes I and II

6.1.1 The NAT SPG was informed that the processing of the Proposals for Amendment (PfA) to Volumes I and II of the *North Atlantic Regional Air Navigation Plan*) (NAT eANP, Doc 9634) had been completed. It was noted that the PfA to Volume I, (Serial No: EUR/NAT-I 15/01 - AOP-CNS-ATM-MET-SAR-AIM), had been circulated to States and approved by the President of the Council on 24 February 2016 (Approval letter reference: EUR/NAT 16-0125.TEC of 26 February 2016 refers) and the PfA to Volume II, (Serial No: EUR/NAT-II 16/02 - AOP-CNS-ATM-MET-SAR-AIM), had been approved on 13 May 2016, (Approval letter reference: EUR/NAT 16-240.TEC of 13 May 2016 refers).

6.1.2 The approved versions of the NAT eANP have been uploaded on the ICAO EUR/NAT public website under "EUR/NAT Documents", available at **www.icao.int/EURNAT/Pages/EUR-and-NAT-Document.aspx**.

Update on NAT eANP Volume III

6.1.3 The NAT SPG was informed of the outcomes of the NAT eANP Volume III Project Team (NAT eANPV3 PT) that had been established by NAT IMG Decision 47/10. It was noted that the NAT eANPV3 PT developed a maintenance process and a recommended structure for the Volume III material which included suggested refinements to the Air Navigation Reporting Forms (ANRFs) which would be used to provide detailed information about the implementation of ASBU Module Elements and Regional Aviation System Improvements (RASI).

6.1.4 With regard to the review of dynamic content and the maintenance process, the NAT IMG had agreed that the NAT POG and NAT TIG should be tasked with developing the dynamic content of Volume III (namely, the *NAT Service Development Roadmap* (NAT SDR), ASBU implementation status tables and the detailed information in the ANRFs) [NAT IMG Decision 48/15-*Finalisation of NAT eANP, Volume III* refers].

6.1.5 The NAT IMG had also agreed on the following review and maintenance process to be initiated during the autumn 2016 NAT POG and NAT TIG meetings:

a) <u>Autumn 2016 meetings</u>:

i) review and propose updates to the *NAT Service Development Roadmap* (NAT SDR) for approval by NAT IMG/49 (November 2016);

ii) review and suggest updates the Aviation System Block Upgrade (ASBU) implementation status tables in the ICAO NAT Region; and

iii) review drafted ANRFs for NAT Regional Aviation System Improvements (ANRF-RASIs) and ASBUs (ANRF-ASBUs) to identify work required to finalise them;

b) Spring 2017 meetings: based on the updated NAT SDR and work on ANRFs identified at autumn 2016 meetings, finalise ASBU implementation status tables and ANRFs for NAT IMG/50 (Spring 2017) endorsement and NAT SPG/53 (June 2017) approval; and

c) Subsequent meetings: dynamic content (ANRFs and NAT SDR) to be reviewed at each meeting, with the expectation that any suggested changes be finalized at the spring meetings, so it could be considered by the NAT IMG immediately preceding the annual NAT SPG meetings.

6.1.6 Based on the above NAT IMG/48 agreement, the appropriate text describing the Volume III maintenance process was developed and included in the draft Volume III (paragraph 4, page I-3 in **Appendix L** refers).

6.1.7 It was noted that as regular updates to the ASBU and RASI ANRFs would be provided through the regular meetings of the NAT POG and NAT TIG and proposed for endorsement by the spring NAT IMG and NAT SPG meetings, appropriate amendments to the work programmes of these Groups would be proposed at the autumn 2016 meetings for further approval by NAT IMG/49 (November 2016). Additionally, to support these new tasks, the Secretariat would develop briefings for the autumn 2016 meetings of these Groups to familiarize them with the purpose and content of Volume III. Consequently, this activity could negate the need to convene a workshop as previously foreseen in NAT IMG Decision 47/09 [*Workshop on further work to finalise Volume III of the NAT eANP*].

6.1.8 Accordingly, it was agreed to update the *North Atlantic Systems Planning Group* (NAT SPG) *Handbook* (NAT Doc 001), section "Reference Documentation", to take account of the new responsibilities of the NAT IMG Contributory Bodies in this respect as well as the discontinuation of the current *NAT Service Development Roadmap* (NAT SDR, NAT Doc 009) when the new Volume III would be approved at the NAT SPG/53 (June 2017).

6.1.9 The NAT SPG was informed that the previous NAT eANP Project Team (NAT eANP PT) had also suggested improvements to the Council-approved templates of the eANP (*NAT IMG/47 Summary of Discussions* (Dublin, November 2015), paragraphs 7.14 to 7.17 refer). In this respect, it was recommended that the procedure for amendment of Volume III in Appendix A, Part 0-Introduction of Volume I, be amended to take account of the agreed process of update and maintenance.

6.1.10 It was noted that these proposals would be submitted to ICAO Headquarters for further processing after the initial versions of the ANPs of all Regions had been approved. It was informed that the ICAO Secretariat working group, the eANP working group (eANP WG), composed of representatives from each Regional Office and ICAO Headquarters, which developed the initial Council-approved templates, would be revived in 2017 in order to make a post-implementation review and to consolidate all suggested improvements. The revised templates of all Volumes would be processed formally for the approval of the ICAO Council.

6.1.11 The NAT SPG was presented with the refined NAT ANRF templates (**Appendix L**, pages I-9 and I-15 refer) which had been approved by the NAT IMG [NAT IMG Decision 48/13–*NAT Air Navigation Reporting Form (ANRF) Templates* refers]. The updates included the removal of duplications and consolidation of Element-related material; change to the "Benefits and Implementation Challenges" section to refer to the Module (or RASI) as a whole, rather than to each Element, and the renaming of the former "Benefits" section as "Achieved Benefits" because expected benefits for each of the ASBU Modules were already detailed in the *Global Air Navigation Plan* (GANP, Doc 9750) and other ICAO documents.

6.1.12 These revised ANRF templates would be used to draft NAT ANRFs for applicable ASBU Modules and the NAT RASIs. As already outlined above, these draft ANRFs would be reviewed and updated as required by the NAT POG and NAT TIG at their autumn 2016 and spring 2017 meetings, and presented to NAT IMG/50 for endorsement. Once endorsed by the NAT IMG, they would be presented to NAT SPG/53 for approval for inclusion in Volume III of the NAT eANP.

6.1.13 The NAT SPG noted the information provided at NAT IMG/48 that IATA was promoting the use of the foregoing refined ANRF template by other Regions and that Canada and the United States were preparing a paper for the upcoming ICAO Assembly to propose a harmonised process and templates for ASBU implementation reporting for use by other ICAO Regions.

6.1.14 With regard to possible approaches for reporting ASBU implementation status, the NAT SPG noted the NAT IMG decision to use numbers to provide information at the State level [NAT IMG Decision 48/14 - *Assessment and Reporting of ASBU Implementation* refers]. The number would indicate the number of States under each Status category. This approach would provide more information on the progress of implementation than the previously proposed used of "X". Specific details would be available on the applicable ANRFs. Using this approach, as each State completed all needed implementations at their Table AOP I-1 aerodromes (or, for non-aerodrome Elements, completed needed implementations) they would be counted under "Implemented". This approach was taken into account in the finalized explanation of the Workflow Diagram (**Appendix L**, Figure GEN III-1, page I-2 refers) to clarify how each status descriptor should be applied.

6.1.15 It was also informed that the NAT IMG agreed that the NAT eANP should track the ASBU implementation status of the NAT provider States in relation to any systems or services that supported operations in the ICAO NAT region.

6.1.16 Upon noting these outcomes of the work of the NAT eANPV3 PT, the NAT SPG agreed with the NAT IMG recommendation that the NAT eANPV3 PT be kept functional until NAT IMG/49 in order to ensure and support a smooth transition of the maintenance responsibility to the NAT IMG Contributory Bodies.

6.1.17 The NAT SPG endorsed the draft format of Volume III on the understanding that further update of its dynamic content would be conducted by the NAT IMG and its Contributory Bodies:

NAT SPG Conclusion 52/09 – Draft format of the NAT eANP, Volume III

That:

a) the proposed draft format of Volume III of the NAT eANP, that does not include updated dynamic content, shown in **Appendix L** to the NAT SPG/52 Report be endorsed; and

b) the ICAO Regional Director, Europe and North Atlantic, publish the endorsed format of Volume III of the NAT eANP on the ICAO EUR/NAT website.

6.2 PFA TO THE NAT SUPPS AND NAT DOC 007, ON FREE ROUTE OPERATIONS

6.2.1 The NAT SPG recalled that the NAT Free Route Operations Implementation Project Team (NAT FROI PT) had been established to propose criteria and timelines for the establishment of Free Route Operations across the NAT HLA. This task had been expected to be completed by the end of May 2016 in order to align with adjacent Regions' work and support a proposed implementation in the Bodø OCA which initially had been targeted for June 2016 (NAT IMG Decision 47/06-*Establishment of the NAT Free Route Operations Implementation Project Team (NAT FROI PT)* refers).

6.2.2 The NAT SPG noted that the NAT IMG recalled that in addressing this subject it had agreed that the NAT Region airspace was "de facto, a free-route operations airspace" but was missing a formal and clear definition of free route airspace (*NAT IMG/47 Summary of Discussions* (Dublin, November 2015), paragraph 6.3 refers).

6.2.3 The NAT FROI PT reviewed the available definitions of Free Route Airspace as documented by various States in the ICAO EUR Region and found no contradiction between these definitions and the types of operations that were already taking place in the NAT Region airspace. The following definition was therefore adopted as the basis for the NAT FROI PT's further work:

Free Route Airspace is a specific section of airspace in which users may freely plan a route between a defined entry point and a defined exit point, with the possibility of routing via intermediate (published or unpublished) way points, without reference to the ATS route network, subject to airspace availability. In this airspace, flights remain subject to air traffic control.

6.2.4 The NAT FROI PT determined that the appropriate place to incorporate this definition should be in the *NAT Regional Supplementary Procedures* (NAT SUPPs, Doc 7030), in Chapter 2 – Flight Plans. This Chapter included material defining the usual flight planning provisions. It was noted that the NAT FROI PT agreed it was not the intention to replace the current flight planning provisions, but rather to document that States could define areas where free route operations would apply.

6.2.5 A proposed change to section 2.1.9 of the NAT SUPPs had been agreed provisionally by NAT IMG/48 but open to comments from the NAT IMG members by 1 June 2016 to allow the project lead and the ICAO Secretariat to consolidate a proposal for the NAT SPG.

6.2.6 Since the NAT IMG/48 meeting, further coordination took place with the NAT IMG members on the proposed amendment to the NAT SUPPs. Based on the input received by the Secretariat, the original proposed text, specifically the words "*within the NAT Region, airspace may be designated as Free Route Airspace*" was found in contradiction with the claim recorded at NAT IMG/47 that the NAT Region airspace was "de facto, a free-route operations airspace". In addition, the proposed exclusion of the current provisions detailed in sections 2.1.9.2 and 2.1.9.3 of the NAT SUPPs (Doc 7030) relating to flight planning in the NAT Region could not be considered without a thorough analysis of its potential impact (operational, economic and safety wise) on the NAT system as a whole.

6.2.7 Following additional consultation between the NAT SPG members and the Secretariat, it was found that the best way forward would be a minimal change to the NAT SUPPs provisions, complemented with an amendment to the *North Atlantic Operations and Airspace Manual* (NAT Doc 007) providing the necessary definition of the free route operations airspace. In this respect, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/10 – PfA to NAT SUPPs, for Free Route Operations

That:

a) the following proposed change to section 2.1.9 of the *NAT Regional Supplementary Procedures* (NAT SUPPs, Doc 7030) be endorsed:

2.1.9 Route

2.1.9.1 General

2.1.9.1.1 Flights conducted wholly or partly outside the organized tracks shall be planned along great circle tracks joining successive significant points. Unless otherwise prescribed by the appropriate ATS Authority, fFlight plans shall be made in accordance with the following.

b) the ICAO Regional Director, Europe and North Atlantic, process the proposed amendment in accordance with the formal procedures.

NAT SPG Conclusion 52/11 – Amendment to NAT Doc 007 on Free Route descriptions

That:

a) the NAT Document Management Office (NAT DMO) be tasked to amend the *North Atlantic Operations and Airspace Manual* (NAT Doc 007), as indicated in **Appendix M** to the NAT SPG/52 Report; and

b) the ICAO Regional Director, Europe and North Atlantic, take appropriate actions to publish the updated NAT Doc 007.

6.3 PfA to the NAT SUPPs, on ADS-B ITP

6.3.1 The NAT SPG was presented with a PfA to the NAT SUPPs (Doc 7030) addressing the implementation of the Automatic Dependent Surveillance – Broadcast In Trail Procedure (ADS-B ITP)) in the New York Oceanic East FIR.

6.3.2 The NAT SPG noted that the ADS-B ITP was a pilot-requested procedure utilizing ADS-B IN and air traffic control capabilities to allow more flights to achieve their preferred vertical profiles and thereby increasing both capacity and efficiency in the oceanic domain. It was noted that detailed related procedures were covered in paragraph 5.4.2.7 of the PANS-ATM, (Doc 4444).

6.3.3 In this respect, the NAT SPG was informed that paragraph 5.4.2.7.3.2 d) 2) of PANS-ATM (Doc 4444) stated that both the ITP aircraft and reference aircraft on parallel tracks or same tracks were not permitted to make turns during the manoeuvre. However, based on the capabilities of the United States Advanced Technologies and Oceanic Procedures (ATOP) automation system and the safety risk management assessment, it had been determined that aircraft conducting the ITP permitted to make turns during the manoeuvre would not result in an infringement of the required separation minima.

6.3.4 The ICAO Secretariat informed that a preliminary coordination had taken place with ICAO Headquarters which found that this PfA was in conflict with the existing PANS-ATM provisions and therefore should not be progressed in accordance with the ICAO procedures for amendment of the SUPPs (Doc 7030). The NAT SPG noted this statement but felt that a formal response from ICAO Headquarters describing the rationale would be useful and to allow initiation of a dialogue and provide all available documentation collected by the United States in support of the PfA.

6.3.5 Based on the information submitted, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/12 – PfA to NAT SUPPs, for the Implementation of the Automatic Dependent Surveillance – Broadcast In-Trail Procedure (ADS-B ITP) in the NAT Region

That:

a) the following proposed amendment to paragraph 6.2.2.4 of the *NAT Regional Supplementary Procedures* (NAT SUPPs, Doc 7030) be endorsed:

> 6.2.2.4 Within the New York Oceanic FIR, the ADS-B In-Trail Procedure (ITP) will be applied in accordance with 5.4.2.7 of the PANS-ATM, with the exception of 5.4.2.7.3.2 d) 2). Aircraft conducting the ITP will be permitted turns during the manoeuvre that do not degrade required separation.

b) the ICAO Regional Director, Europe and North Atlantic process the proposed amendment in accordance with the formal procedures.

6.4 Updates to the North Atlantic Systems Planning Group Handbook (NAT Doc 001)

6.4.1 The Secretariat presented the NAT SPG with a series of proposals to amend the current *NAT SPG Handbook* (NAT Doc 001) to keep it accurate and up-to-date. The NAT SPG endorsed the amendments and approved the following:

NAT SPG Conclusion 52/13 – Amendment to NAT Doc 001

That:

a) the *North Atlantic Systems Planning Group* (NAT SPG) *Handbook* (NAT Doc 001) be amended as presented at **Appendix N** to the NAT SPG/52 Report; and

b) the ICAO Regional Director, Europe and North Atlantic, take appropriate action to publish and promulgate the updated NAT Doc 001.

6.5 NAT AIR TRAFFIC MANAGEMENT OPERATIONAL CONTINGENCY PLAN (NAT DOC 006)

Common EUR/NAT Volcanic Ash Contingency Plan (VACP)

6.5.1 The NAT SPG was apprised of the work of the 2015 EUR/NAT Volcanic Ash Task Force (VATF) and its progress towards a common European (EUR) and North Atlantic (NAT) *Volcanic Ash Contingency Plan* (VACP). It was noted that the 2015 EUR/NAT VATF convened as agreed for a second and final meeting in Paris, France, on 11 and 12 February 2015, with the objective to review the final draft of the proposed common EUR/NAT VACP.

6.5.2 The EUR/NAT VATF/2 meeting was co-chaired by the Chairmen of the European Air Navigation Planning Group's Programme Coordinating Group (EANPG COG) and the NAT IMG with the support of the VATF Rapporteur, and assisted by the Secretariat. The VATF was provided with an updated draft for the proposed common EUR/NAT VACP document body, amended by the Secretariat in accordance with the actions decided at the Experts' meeting. This draft EUR/NAT VACP document body also incorporated, using track changes, the comments and suggestions made by several NAT IMG members, following the invitation to do so at NAT IMG/47.

6.5.3 The NAT SPG was informed that the VATF unanimously supported the principle to achieve a common document for both EUR and NAT Regions, designed for the aviation community at large, containing, to the greatest extent possible, common text, and accommodating Regional or sub-Regional variations inside Attachments.

6.5.4 The NAT SPG noted that the VATF agreed to use in the VACP the ICAO definitions for Appendices or Attachments as follows:

a) **Appendices** comprise material grouped separately for convenience but forming part of the main body of the document; and

b) **Attachments** comprise material supplementary to the main body of the document, or included as a guide to the application of the provisions in the document.

6.5.5 The NAT SPG was informed that the VATF performed a paragraph by paragraph thorough review of the main body of the draft proposed common EUR/NAT VACP, and, following the principles agreed, came up with a common text addressing most of the comments and suggestions brought by the NAT members of the VATF. The VATF addressed the remaining issues, namely "Danger Areas", "use of "Air Traffic Flow Management (ATFM)", "use of supplementary information", "training related information", and "pre-eruption phase", in break-out groups tasked to come up with appropriate and consensual adjustments to the text previously reviewed and agreed.

6.5.6 The NAT SPG noted that the VATF also endorsed the following principles for managing the document and its Appendices and Attachments once approved as a common EUR/NAT VACP, designed to prevent uncoordinated amendment:

a) proposals for amendment to the common EUR/NAT VACP: to be channelled through the appropriate working body in the EANPG or the NAT SPG working structure, as seen fit, for initial assessment before further processing;

b) amendment to an Attachment: to be endorsed by either the EANPG COG or the NAT IMG, as appropriate, once assured that the impact to the resulting document was under control and limited to the content specific to the attachments;

c) amendment to an Appendix: to be endorsed by both the EANPG COG and the NAT IMG, once assured that the impact to the resulting document was under control and limited to the content of appendices and/or attachments;

d) amendment to the main body:

i. to be reviewed by both the NAT IMG and EANPG COG, for endorsement;

ii. to be approved by both the NAT SPG and EANPG (once endorsed by the NAT IMG and COG);

e) the COG and NAT IMG, as appropriate, to be informed only about the existence of the amendments that were endorsed by the other group because the amendments had an impact to only one ICAO Region (EUR or NAT); and

f) in case of a broad issue, such as the one at the origin of the 2015 EUR/NAT VATF, experts of both Regions should be involved and to be resolved in the best interest for both Regions.

6.5.7 It was also noted that the VATF agreed that Attachments to the EUR/NAT VACP be organised by topic, contain three (3) sections – EUR East, EUR West, and NAT – marked "intentionally left blank" when no text was provided in the section.

6.5.8 The NAT SPG noted that the EUR/NAT VATF/2 meeting agreed that the draft common EUR/NAT VACP main document body amended during the meeting was final, and that the VATF could be disbanded. It was noted that the VATF members had then been tasked to complete the VACP Appendices and Attachments before the end of March 2016, and that the Secretariat was in charge of collating them into a final draft EUR/NAT VACP, to be presented at the next meetings of EANPG COG and NAT IMG (NAT IMG/48, 9-12 May 2016, and EANPG COG/65, 30 May-3 June 2016) for endorsement.

6.5.9 The NAT SPG noted that the resulting final draft of the *Volcanic Ash Contingency Plan – European and North Atlantic Regions* (EUR Doc 019, NAT Doc 006 Part II) was provided to the NAT IMG/48 (Paris, France, 9-12 May 2016) where it was reviewed and endorsed. The NAT SPG also noted that the EUR/NAT VACP was also reviewed and endorsed at NAT SOG/14 (Paris, France, 6–9 June 2016).

6.5.10 The NAT SPG was informed that the EUR/NAT VACP had been presented at EANPG COG/65 (Prague, June 2016), where it was endorsed through the EANPG COG Conclusion 65/01 (*EANPG COG/65 Summary of Discussions*, paragraph 6.17 refers). Considering the EANPG meeting would take place only at the end of November 2016 and the need for an approved VACP to be put in place as soon as possible, the EANPG COG invited the Secretariat to seek EANPG members' approval by correspondence, which was done in the wake of COG/65. The NAT SPG was then informed that the EANPG had approved the EUR/NAT VACP by correspondence (silence procedure).

6.5.11 Based on the foregoing, the following NAT SPG Conclusion was approved:

NAT SPG Conclusion 52/14 – Approval of the EUR/NAT VACP
(*EANPG COG Conclusion 65/1*)

That:

a) the *Volcanic Ash Contingency Plan – Europe and North Atlantic Region* (EUR/NAT VACP: EUR Doc 019, NAT Doc 006 Part II) be updated as provided at **Appendix O** to the NAT SPG/52 Report, as Edition 2.0.0;

b) this EUR/NAT VACP Edition 2.0.0 becomes applicable as soon as possible once approved by the European Air Navigation Planning Group (EANPG);

c) the ICAO Regional Director, Europe and North Atlantic take appropriate actions to publish and promulgate the updated EUR/NAT VACP (EUR Doc 019, NAT Doc 006 Part II, Edition 2.0.0); and

d) the 2015 EUR/NAT Volcanic Ash Task Force (VATF) be disbanded.

6.5.12 Finally the NAT SPG commended the excellent work and contributions from the VATF members, including NAT Region participants who provided constructive inputs to improve the draft EUR/NAT VACP so that it could reach its current satisfactory state for both Regions.

Other Updates to NAT Doc 006

6.5.13 The NAT SPG was presented with a PfA to the *Air Traffic Management Operational Contingency Plan - North Atlantic Region* (NAT Doc 006, Part I) regarding the following changes:

a) changes to contingency tracks as defined in Chapter 3.7.1.;

b) changes to contact details for Reykjavik Oceanic Area Control Centre (OACC)) in Appendix B; and

c) changes to "Eurocontrol Central Flow Management Unit (CFMU)".

6.5.14 Therefore the NAT SPG agreed to the following:

NAT SPG Conclusion 52/15 – PfA to NAT Doc 006, Part I, on Updates to Reykjavik Contingency Routes and Contacts

That:

a) the proposal for amendment to the *Air Traffic Management Operational Contingency Plan - North Atlantic Region* (NAT Doc 006), as detailed in **Appendix P** to the NAT SPG/52 Report be endorsed;

b) the terms "Eurocontrol Central Flow Management Unit" and "CFMU" be consistently replaced by "Network Manager Operations Centre" or "NMOC" throughout NAT Doc 006, Part I; and

c) the ICAO Regional Director, Europe and North Atlantic take appropriate action to publish and promulgate the updated NAT Doc 006, Part I.

6.6 NAT OPERATIONS AND AIRSPACE MANUAL (NAT DOC 007)

6.6.1 The NAT SPG was presented with a proposal for amendment to *North Atlantic Operations and Airspace Manual* (NAT Doc 007) to make changes to the "Blue Spruce" Routes as defined in NAT Doc 007, Chapter 12.2.2. These changes were required by the introduction of new waypoints and navaids. Therefore the NAT SPG agreed to the following:

NAT SPG Conclusion 52/16 – Amendment to NAT Doc 007, Subsequent to new waypoints in "Blue Spruce" Routes descriptions

That:

a) the NAT Document Management Office (NAT DMO) be tasked to amend the *North Atlantic Operations and Airspace Manual* (NAT Doc 007), as indicated in **Appendix Q** to the NAT SPG/52 Report; and

b) the ICAO Regional Director, Europe and North Atlantic, take appropriate actions to publish the updated NAT Doc 007.

6.7 NAT FUTURE CONCEPT OF OPERATIONS (NAT CONOPS)

6.7.1 The NAT SPG was informed that NAT IMG/48 approved Decision 48/01 on the consolidated NAT region vision of the future NAT concept of operations. The objective of the Decision was to organize a NAT IMG meeting/WEBEX in Summer 2016 to review the Gap Analysis produced by the NAT 2025 CONOPS task force, *Future ATM Concept of Operations for the North Atlantic Region* (NAT Doc 005)) and the *NAT Service Development Roadmap* (NAT SDR, NAT Doc 009) to reach consensus on the potential components for the *NAT Future Concept of Operations* (NAT CONOPS) . It was expected that this work would be completed by NAT IMG/49 and coordinated with the NAT SPG members by correspondence.

6.7.2 In this respect, the NAT SPG noted that the operational and technical considerations from other adjacent ICAO Regions would need to be taken into account in the development of the updated *NAT Future Concept of Operations*. As the NAT Region had many operational interfaces with several other Regions it would be essential that any consolidated NAT vision be harmonised, seamless and synchronised with its neighbouring Regions.

6.7.3 In this regard, the NAT SPG shared information about participation by some members in a recent meeting of the South Atlantic Region (SAT) groups. IATA stated that the SAT Region could benefit from the experience and lessons learnt in the NAT Region. In view of the above, the NAT SPG noted the offer from Portugal to be a focal point for coordination with the SAT groups. To that end, the NAT SPG felt that the representatives from the SAT groups could be invited to attend some of the NAT POG, NAT TIG or other NAT SPG sub-groups meetings, as required.

6.7.4 Therefore, to ensure an appropriate level of inter-regional coordination during the development of the *NAT Future Concept of Operations* and in order to achieve a harmonised, seamless and synchronised implementation, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/17 – Coordination with ICAO Regions Adjacent to NAT Region on the NAT Concept of Operations

That the ICAO Regional Director, Europe and North Atlantic:

a) review the NAT Region coordination mechanism with adjacent ICAO Regions to be used during the development of the *NAT Future Concept of Operations*; and

b) identify/create opportunities whereby the NAT Region can engage with adjacent ICAO Regions on the development and sharing of best practice.

7. WORK PROGRAMME INCLUDING SUB-GROUPS

7.1 NAT IMG OUTCOME

7.1.1 The NAT SPG noted the outcomes of the Forty-seventh Meeting of the North Atlantic Implementation Management Group (NAT IMG/47) which took place from 2 to 5 November 2015 in Dublin, Ireland and the Forty-eighth Meeting (NAT IMG/48) held from 9 to 12 May 2016 in Paris, France. The outcomes of these meetings have been reported in various parts of this report.

Future NAT IMG meetings

7.1.2 The NAT SPG agreed that NAT IMG/49 would take place in Reykjavik, Iceland, from 7 to 10 November 2016.

7.2 REPORT OF THE NAT SOG

7.2.1 The NAT SPG was presented with the outcome of the NAT SOG/14 meeting which was held in Paris, France, from 6 to 9 June 2016. The NAT SPG noted NAT SOG's appreciation regarding the participation of the representative from Spain and noted the importance of Spain's contribution to the discussion concerning their interface with Shanwick and Santa Maria. The NAT SOG stressed the necessity of attendance from Spain at future NAT SOG meetings.

Future NAT SOG meetings

7.2.2 The NAT SPG agreed that the Fifteenth meeting of the North Atlantic Safety Oversight Group (NAT SOG/15), would be held from 6 to 9 December 2016 at IATA's premises in Miami, Florida in cooperation with the United States and noted that NAT SOG/16 would take place in Paris, France, at the EUR/NAT Office of ICAO in the spring of 2017. Additionally, for its seventeenth meeting (NAT SOG/17), Ireland had very kindly offered to hold it in Dublin, Ireland, with the dates to be further coordinated with the Group.

7.3 REPORT OF THE NAT EFFG

7.3.1 The NAT SPG was presented with the outcome of the twenty-ninth meeting of the North Atlantic Economic, Financial, and Forecast Group (NAT EFFG/29), held in Toronto, Canada, from 31 August to 4 September 2015, and its thirtieth meeting (NAT EFFG/30) that took place in the EUR/NAT Office of ICAO, from 18 to 20 May 2016.

Traffic levels/patterns

7.3.2 The NAT SPG noted information on the traffic levels and patterns and that the global outlook pointed to a slow and long economic recovery turning fragile. Global economic growth was revised downwards (since the July 2015 update) across the board, reflecting a loss of momentum in the advanced economies and continuing headwinds for emerging economies. Downside risks included tightening of financial conditions in advanced economies, in addition to Britain's upcoming referendum on quitting the European Union, the so called "Brexit", in June 2016. Low oil prices in 2015 assisted airlines to record higher profits, but continued volatility and uncertainty were expected for the oil market. It was noted that the information on the North Atlantic Performance Trends had been made available in the European and North Atlantic (EUR/NAT) Office public pages on the ICAO website.

Space-Based ADS-B OUT

7.3.3 The NAT SPG noted that the NAT EFFG 29th and 30th meetings progressed the Business Case Assessment (BCA) on SB ADS-B as a follow-up to its NAT EFG Decision 26/1 [*Initial Space Based ADS-B Business Case Analysis*] and to NAT SPG Conclusion 50/07 [*Space-Based ABD-B Initiative*].

7.3.4 The NAT SPG noted that a survey of airline operators in the NAT region was nearly complete. The operators participating in the survey accounted for nearly seventy (70) percent of NAT Region traffic. As of May 2016, eighty-eight (88) percent of the surveyed operators were equipped with certified ADS-B Out, projected to be ninety-three (93) percent by 2018, and ninety-six (96) percent by 2020. Using the survey, the next steps included completing equipage cost estimates, compiling an operational shortfall analysis for the NAT Region, developing the ANSP cost survey, finishing benefits estimates with CONOPS and finalized assumptions, and continuing to estimate incremental cost and risk analyses.

7.3.5 The NAT SPG noted that ADS–B equipment was already mandated for airframes operating in Northern America and in Europe at the time SB ADS–B operations were expected to be available for the NAT. With that in view, it was anticipated only a marginal number of aircraft operating in the NAT could not benefit from SB ADS–B. It was noted, and supported, that the NAT EFFG agreed to meet and finalise assumptions and parameters for a NAT SB ADS–B BCA at a dedicated workshop, in Montréal, Canada, on

23 and 24 August 2016, as this was one of the outcomes from the NAT Space-Based ADS-B Project Team (NAT SB ADS-B PT), to be delivered by December 2016.

NAT Traffic Forecast

7.3.6 The NAT SPG received a presentation on the overall traffic forecast for the NAT Region, as a follow-up to NAT SPG Conclusion 50/21 [*Provision of NAT Traffic Forecast by the NAT EFG*].

7.3.7 It was noted that NAT EFFG/30 adopted a new traffic forecast methodology, replacing the previous forecast method[2] that first developed a passenger forecast and then derived a flight count forecast from the passenger forecast. The new forecast methodology utilized publicly available information about carrier fleet orders and business plans for serving transatlantic traffic demand, and would be updated twice each year. Because fleet plans become more speculative beyond the first five years of the forecast, the new method was to rely on macro level forecasts for the long-term portion, beyond the first five years.

7.3.8 The NAT SPG was informed that the near-term forecast (first five years) was based on detailed projections for 48 individual carriers. The current collection of 48 individual carriers included commercial passenger and cargo airlines that accounted for about 80 percent of the total NAT traffic in almost all FIRs. The selected 48 carriers included the largest operators, fastest growing carriers, low-cost carriers (LCC) and other carriers of special interest. Forecasts for each of these 48 carriers were based on publicly available information about their individual fleets and network plans. The near-term (five-year) NAT flight count forecast, based on fleet analysis, projected a 3.6 percent average annual growth rate. The long-term portion of the forecast used the end of the near-term forecast as its starting point, and was composed from different sources including IATA, ICAO (FESG CAEP), Boeing and Airbus, defining high- (maximum), central- (median), and low- (minimum) growth forecast scenarios beyond the five-year point.

7.3.9 The NAT SPG noted that when the long-term forecast was combined with the near-term forecast, the 20 year forecast (2015 – 2035) resulted in 4.4 percent, 3.2 percent, and 2.4 percent average annual growth rates for the high-, central- and low-growth scenarios respectively.

7.3.10 Additionally, the NAT SPG noted that the NAT EFFG adopted the following process for updating the NAT traffic forecast:

a) all ANSPs to provide current traffic data for their respective FIR in advance of the next publication date:

   (1) end of August for publication on 1 October; or

   (2) end of February for publication on 1 April;

b) this current traffic data would then be processed by the United States forecasting team to update the NAT traffic forecast;

c) the updated NAT traffic forecast would then:

   (1) be reviewed at the fall NAT EFFG meeting, for publication on 1 October; or

   (2) be reviewed by correspondence by the NAT EFFG members, with a deadline in mid-March, for a publication on 1 April;

and;

d) once reviewed and endorsed by the NAT EFFG, the updated overall NAT traffic forecast would be promulgated to replace the previous one.

[2] The previous method was unconstrained, driven primarily from macroeconomic variables, and updated only once every two years, so not responsive to variations in business cycles and fee charging purposes.

7.3.11 Based on the foregoing, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/18 – Approval of the NAT Traffic Forecast

That;

a) the new overall NAT traffic forecast from the North Atlantic Economic, Financial and Forecast Group (NAT EFFG), provided in **Appendix R** to the NAT SPG/52 Report be endorsed;

b) the NAT EFFG be assigned to update, review and endorse the overall NAT traffic forecast every 6 months; and

c) the ICAO Regional Director, Europe and North Atlantic promulgate the first overall NAT traffic forecast, then replace it with subsequent updates as instructed by the NAT EFFG.

Future NAT EFFG meetings

7.3.12 The NAT SPG noted that NAT EFFG/31 would take place in Prestwick, United Kingdom, for a three-day meeting, from 21 to 23 September 2016, starting in the afternoon on the first day. It was planned that NAT EFFG/32 would take place in the ICAO EUR/NAT Office in Paris, France, from 26 to 28 April 2017.

7.4 INTERIM REPORT OF THE ICAO APAC/NAT INTER-REGIONAL ADS-C REPORTING INTERVAL TASK FORCE (ADS-C RITF)

7.4.1 The NAT SPG was provided with an interim report of the ICAO Asia and Pacific (APAC)/NAT Inter-regional ADS-C Reporting Interval Task Force (ADS-C RITF/1) that held its meeting from 21 to 23 June 2016 in the ICAO EUR/NAT Office in Paris, France. It was recalled that the ADS-C RITF was established by NAT IMG Decision 45/11 and APANPIRG (Asia Pacific Air Navigation Planning and Implementation Regional Group) Conclusion 26/46 with the following main objectives per its ToRs:

a) gain a better understanding of the sensitivities to system loading based on ADS-C reporting intervals that are used;

b) determine minimum ADC-C periodic reporting interval that would be technically feasible under specified conditions and without significantly impacting operational performance;

c) determine benefit to the regions in their planning and implementation of future ATM concepts of operation (e.g. *NAT Service Development Roadmap* and *Future 2025 Concept Of Operations*); and

d) support validation of future standards for applying separation minima based on ADS-C, such as 37 km (20 NM) longitudinal separation minimum, currently under development by the Separation and Airspace Safety Panel (SASP).

7.4.2 The NAT SPG noted the following assessment made by the task force:

a) the communications infrastructure is made up of a number of systems that are continuously evolving. In addition, both Inmarsat and Iridium are in the process of introducing new systems that will have impact on any determination carried out by the ADS-C RITF;

b) the communications system performance and load are continuously monitored and balanced by the SSP/CSPs (Satellite Service Provider/Communication Service Provider) to meet fluctuations in system demand;

c) communications systems have finite resources and the oceanic communications infrastructure is a system of systems with many interdependencies, whereby any isolated change to the system parameters, such as reporting intervals, may impact the system performance in other areas; and

d) differences in operational concepts need to be accounted for as they have direct influence on the system usage and load.

7.4.3 The NAT SPG noted the conclusion made by the task force that technically the existing communications system was designed to be capable to cope with all ADS-C periodic reporting intervals down to the minimum stated in the FANS 1/A standards as 64 seconds. However, it was noted that there was no performance data available for the maximum number of contracts at a 64-second interval to validate that this use was feasible. The communications system performance was continuously monitored to match the actual usage in order to balance the system capacity accordingly per system loads in different regions. Through this monitoring, if a need would be determined to increase the system capacity, the SSPs and CSPs would undertake necessary measures to increase the channels capacity, increase the number of frequencies required, and increase the Ground-Earth Stations' (GES) processing power. In order to plan for such measures, coordination with the implementers of reduced separation minima requiring reduced ADS-C reporting intervals would be essential.

7.4.4 To that end, in order to help implementers to manage the process of implementing reduced reporting intervals in support of reduced longitudinal separation minima, the RITF recommended that appropriate guidance material be provided in the following documents:

a) ICAO GOLD Manual (Doc 10037); and

b) ICAO Circular providing implementation guidance for reduced separation minima.

7.4.5 Furthermore, the NAT SPG noted that in response to the ToRs, the following conclusions were made by the task force:

a) Better understand the sensitivities to system loading based on ADS-C reporting intervals:

- The key sensitivities were:

i. for SATCOM (Satellite Communication), how each channel is utilised and loaded in the global beam;

ii. for VHF, RF (Radio Frequency) channel capacity for plain old ACARS (Aircraft Communications Addressing and Reporting System) stations located in oceanic transition areas;

iii. for ANSPs, the impact of the increased reporting rates on system design;

iv. for airspace users and aircraft manufacturers, the impact on avionics.

b) Determine a minimum ADS-C periodic reporting interval that would be technically feasible under specified conditions without significantly impacting operational performance;

- Provided that coordination of new operational concepts and requirements for reduced separation standards supported by higher ADS-C periodic reporting rates is taking place based on requirements and guidance to be included in ICAO Doc 10037 and ICAO Circular XXX, then:

i. For the current Inmarsat Classic/VHF datalink system:

– 3' is feasible, if needed, to support a new separation standard at RSP 180: if widely used, financial impacts may be incurred to support additional system capacity;

– 64” is feasible for abnormal/distress reporting: if used more widely, financial impacts may be incurred to support additional system capacity.

ii. For the Inmarsat SwiftBroadband-Safety (SB-S) system over oceanic and remote airspace:

– 2’ is feasible to support a new separation standard at RSP 180; if widely used, financial impacts may be incurred to support additional system capacity;

– 64” is feasible for abnormal/distress reporting: if used more widely, financial impacts may be incurred to support additional system capacity.

iii. i) above is based on experience of operation of current systems. ii) is an assessment of the evolving future system supported by expanding on the experience of a), theory, and data from on-going evaluations. The effect of reporting intervals below 2 minutes on avionics performance needs to be assessed.

c) Determine benefit to the regions in their planning and implementation of future ATM concepts of operation.

- New SATCOM systems provide new methods for providing position reporting that do not employ ADS-C. These position reports can be streamed at high rates to ground systems. Some of these systems are planned for deployment in the near term.

d) Support validation of future standards for applying minimum separation based on ADS-C, such as 37 km (20 NM) longitudinal separation minimum, currently under development by the Separation and Airspace Safety Panel (SASP).

- See b) above

7.4.6 Finally, the NAT SPG noted the following future actions by the ADS-C RITF:

a) provide this meeting report as an interim ADS-C RITF report to NAT SPG/52 and APANPIRG/27;

b) develop draft amendments to Doc 10037 by September 2016 for the NAT TIG and Operational Data Link Working Group (OPDLWG);

c) provide input material to the ICAO SASP in September 2016;

d) provide a final report to APANPIRG/28 and NAT SPG/53; and

e) regional coordination of future implementations of reduced periodic intervals in support of reduced longitudinal separation minima will be taking place through the appropriate NAT and APAC working groups, as appropriate.

7.4.7 The NAT SPG agreed that the final report of the ADS-C RITF, if available, could also be presented to and approved by NAT IMG/49 and further coordinated with the NAT SPG members by correspondence.

7.5 REPORT OF THE NAT PERFORMANCE-BASED COMMUNICATION AND SURVEILLANCE PROJECT TEAM (NAT PBCS PT)

7.5.1 The NAT SPG was provided with a report of the NAT Performance-Based Communication and Surveillance Project Team (NAT PBCS PT) established to respond to NAT SPG Conclusion 51/07

[*ICAO revised provisions on performance based operations*]. The following summary of the NAT PBCS PT main conclusions was noted:

a) Concerning the State letters referenced in NAT SPG Conclusion 51/07, the ICAO Council had adopted/approved in March 2016 the amendments to Annexes and *Procedures for Air Navigation Services-Air Traffic Management* (PANS-ATM, Doc 4444), which included PBCS provisions, for November 2016 applicability.

b) PBCS provisions would apply required communication performance (RCP) 240 and required surveillance performance (RSP) 180 to communication and surveillance capabilities supporting the application of performance-based horizontal separation minima. NAT air navigation service providers (ANSPs) have implemented or plan to implement or trial these separation minima, as follows:

   i) The *NAT PBCS Implementation Plan*, endorsed by NAT SPG in 2011 and last updated in 2015, addresses the current trials and planned implementations of the following performance-based horizontal separation minima: reduced lateral separation minimum (RLatSM, 46.3 km (25 NM) lateral) and reduced longitudinal separation minimum (RLongSM, 5 minute longitudinal);

   ii) Currently implemented in the New York Oceanic FIR and planned for Santa Maria Oceanic FIR are the following performance-based horizontal separation minima: 55.5 km (30 NM) and 93 km (50 NM) longitudinal separation minima; and a 55.5 km (30 NM) lateral separation minimum; and

   iii) PANS-ATM (Doc 4444) contains the procedures for application of a 42.6 km (23 NM) lateral separation minimum that would support and/or replace applications of 46.3 km (25 NM) lateral (RLatSM) and 55.5 km (30 NM) lateral separation minima.

c) NAT ANSPs have been executing PBCS monitoring programs for several years. The PBCS monitoring programs have been very effective in measuring CPDLC and ADS-C performance against RCP240 and RSP180 in continued operations. The PBCS monitoring programs must also correct non-compliant performance.

d) The *NAT PBCS Implementation Plan* includes tasks, yet to be completed, for the State of the Operator (or Registry) to establish the criteria for an aircraft operator to be eligible to file the appropriate RCP/RSP flight plan designators. The ATC system would use the RCP/RSP flight plan designators to determine whether or not a flight would be eligible to participate in the application of the relevant separation minima.

7.5.2 The NAT SPG was informed that the NAT PBCS PT was coordinating its work with formal and informal groups within the APAC Regions of ICAO where similar activities were taking place to review current PBCS monitoring programs and determine the steps needed to fully implement PBCS in these regions. It was noted that these APAC groups were also coordinating on an APAC PBCS transition strategy to implement PBCS in airspace where 55.5 km (30 NM) and 93 km (50 NM) longitudinal separation and a 55.5 km (30 NM) lateral separation minima were being applied, and recognized that PBCS would not be fully implemented in the APAC Regions by the 10 November 2016 applicability date. The most realistic date identified by APAC groups was 29 March 2018, but no later. A number of draft conclusions related to PBCS requirements for operators and ANSPs and the aforementioned transition strategy have been being coordinated for the 27th meeting of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/27), scheduled for 7-10 September 2016.

7.5.3 The NAT SPG was informed that the NAT PBCS PT had conducted a survey of NAT service providers and States of the Operator (or Registry) for the top NAT airspace users. The results of the survey indicated that the State regulations, procedures and processes in support of PBCS approvals for aircraft operators should be available by November 2016. The NAT ANSPs were planning to implement the

PBCS capability in the ground automation systems in a progressive manner to achieve a Region-wide readiness by March 2018 aligned with the APAC timelines.

7.5.4 In view of the above, the NAT SPG agreed that in order to allow a transition period in accordance with NAT SPG Conclusion 51/07 for States and NAT airspace users to complete their PBCS approval processes, and to harmonize the NAT implementation with the APAC Region, the NAT Regional date for implementation of PBCS/PBN enabled reduced separation minima would also be 29 March 2018.

7.5.5 In view of the above, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/19 – PBCS Operator Requirements in the NAT Region

That, in view of the ICAO amendments on performance-based communications and surveillance (PBCS) and reduced separations with applicability date in November 2016 and ongoing NAT implementations, the ICAO Regional Director, Europe and North Atlantic, urge States of the Operator (or Registry) to take appropriate measures to develop, establish and implement necessary policies and procedures to ensure that their operators conducting flights in the NAT Region can be compliant with PBCS requirements, by 29 March 2018.

NAT SPG Conclusion 52/20 – RCP/RSP Flight Plan Designators

That, the NAT States/ANSPs that plan to apply 42.6 km (23 NM) lateral separation minimum and/or 55.5 km (30 NM), 93 km (50 NM) and/or 5-minute longitudinal separation minima implement the capability to process and apply ICAO PBCS flight plan designators to determine aircraft eligibility for performance-based horizontal separation by 29 March 2018.

7.5.6 The NAT SPG noted that in practical terms, 29 March 2018 would signify the date when the RLatSM and RLongSM would transition from trial status to operational implementation and the existing distance-based separations would be implemented under the newly amended ICAO provisions. It was noted that, for the lateral separation, the date when the actual separation minimum being applied (i.e. 25 NM (RLatSM) or 30 NM) would change to 23 NM, as amended by PANS-ATM (Doc 4444), may occur after but not before 29 March 2018 (p. 7.5.1b), iii) refers).

7.5.7 Concerning NAT SPG Conclusion 51/07, item c), the NAT SPG recalled that the NAT PBCS PT had also the task to review previous proposals for NAT SUPPs (Doc 7030) amendment and prepare a new one, as necessary. However, it was not feasible to start this activity due to the shortage of time and the need to wait for the completion of several pending amendments to the NAT SUPPs (Doc 7030) and the availability of a stable version. As those amendments were now finalised, the Project Team was planning to continue this activity aiming to close this task by the end of 2016.

7.5.8 Similarly, the NAT PBCS PT still needed to complete the work to coordinate a common language for State documents, such as AICs, which were expected to be completed by the end of 2016. Therefore, the NAT SPG agreed that the NAT PBCS PT timeline be extended beyond NAT SPG/52 (provisionally by the end of 2016) to allow them to complete the actions necessary for the roll-out of PBCS-related provisions implementation. When the NAT PBCS PT would complete the work, the NAT IMG and NAT SOG would review and approve it and send it to NAT SPG members for endorsement by correspondence.

8. ANY OTHER BUSINESS

8.1 IFAIMA MEMBERSHIP

8.1.1 The NAT SPG noted that on 4 March 2015, the ICAO Council recognised International Federation of Aeronautical Information Management Association (IFAIMA) as an Organization that could be invited to suitable meetings of ICAO. Consequently, on 11 August 2015, IFAIMA wrote to the ICAO

Regional Director, Europe and North Atlantic, requesting to become a member of the NAT SPG in order to cooperate with ICAO in all AIM and COM related subjects. Based on its Terms of Reference, the NAT SPG agreed to the following:

NAT SPG Conclusion 52/21 – Revised Terms of Reference of the NAT SPG to include IFAIMA as an Observer

That:

a) the Terms of Reference of the NAT SPG to be revised to include the International Federation of Aeronautical Information Management Association (IFAIMA) as an Observer; and

b) the ICAO Regional Director, Europe and North Atlantic, take the necessary action to update and publish a revision to the *NAT SPG Handbook* (NAT Doc 001).

8.2 FAREWELLS

8.2.1 A fond farewell was bid to Ms Patricia Caviston, the outgoing member of the Secretariat, who was stepping down in view of her retirement. Patricia had a long experience working for ICAO for the last 24 years and with the NAT SPG working structure since 2005. The Group thanked Patricia for her excellent support to the NAT meetings and wished her a happy retirement

8.2.2 The Group also bid a warm farewell to Mr Rodolphe Salomon, the outgoing member of the Secretariat, who was returning to Eurocontrol. Rodolphe had joined the Secretariat as a secondee from Eurocontrol in June 2012. The Group commended Rodolphe for his excellent work as Secretary of several NAT SPG Contributory Groups and wished him success in his future endeavours.

8.2.3 Another affectionate farewell was bid to Mr Albano Coutinho, the representative of Portugal, who was stepping down in view of his new responsibilities. Albano had a long experience working with the NAT SPG and NAT SOG for the past 6 years and his constructive contributions would be remembered. The NAT SPG congratulated Albano on his new appointment and wished him excellent achievements in his new role.

8.3 NEXT MEETING

8.3.1 The Group agreed to convene its Fifty-Third Meeting at the EUR/NAT Office of ICAO in Paris, France, from 26 to 29 June 2017.

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APPENDIX A — LIST OF PARTICIPANTS

(Paragraph 0.3 refers)

CHAIRMAN
Ásgeir PÁLSSON

CANADA
Rob THURGUR
Jeff DAWSON
Jean-Pierre CÔTÉ

DENMARK
Kirsten SONDERBY
Peter MAJGÅRD NØRBJERG

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Christophe GUILPAIN

ICELAND
Reynir SIGURDSSON
Hlin HOLM
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Gudmundur HELGASON

IRELAND
Sean PATRICK
Joe TALBOT

NORWAY
Roald A. LARSEN
Per Harald PEDERSEN

PORTUGAL
Albano COUTINHO
Carlos ALVES

UNITED KINGDOM
Stuart LINDSEY
Alastair MUIR (NAT IMG Chairman)
Emma SIMPSON

UNITED STATES
Heather HEMDAL
Anthony FERRANTE (NAT SOG Chairman)
David CHIN (NAT EFFG Chairman)
Kevin HAGGERTY

IATA
Jeff MILLER
Rich STARK

IBAC
Peter INGLETON

NAT CMA
David NICHOLAS

NAT DMO
Alan GILBERT

ICAO
Luis FONSECA DE ALMEIDA
(NAT SPG Secretary)
George FIRICAN (NAT IMG secretary)
Arkadii MERKULOV
Blandine FERRIER
Celso FIGUEIREDO
Christopher KEOHAN
Elkhan NAHMADOV
Rodolphe SALOMON
Sarantis POULIMENAKOS
Patricia CAVISTON
Patricia CUFF

Participants and Members Contact List

(Paragraph 0.3 refers)

- RESTRICTED -

APPENDIX B — RLATSM (SHANWICK AND GANDER) PHASE 1 DATA BASELINE

(paragraph 3.1.2 refers)

BASELINE (PHASE-1)		
Ident	**Description**	**Data**
Reporting Period: 15th December 2015 – 31st May 2016		
BL1-1	Number of days since start of the RLatSM Phase 1 trial	169
BL1-2	Number of days RLatSM Westbound tracks were published	107
BL1-3	Number of days RLatSM Eastbound tracks were published	131
BL1-4	Number of flights that received a clearance on Westbound RLatSM tracks Half-Degree track Outer track	8,356 (1,801) (6,555)
BL1-5	Number of flights that received a clearance on Eastbound RLatSM tracks Half-Degree track Outer track	10,783 (2,365) (8,418)
BL1-6	Number of days RLatSM Eastbound tracks tactically suspended	1
BL1-7	Number of days RLatSM Westbound tracks tactically suspended	3

Commentary: RLatSM phase 1 transition build successfully deployed 14th December. First set of RLatSM tracks published 15th December. RLatSM tracks are designed based upon a variety of operational considerations, primarily upon the location of the jet streams and the predicted / easily identifiable core tracks.

The three tactical suspensions of the RLatSM Westbound tracks recorded:

The first suspension 9th January: Time 16:49z. Engineering advised Shanwick SITA/ARINC issues. Coordinated suspension of RLatSM at time 16:50z. 17:07z - SITA link restored however due to ARINC issues continuing the decision was made to suspend RLatSM for the remainder of the Westbound flow. Following the failure 3 aircraft were re-cleared by the Shanwick planner prior to entering Shanwick to regain standard separation. There were no losses of separation.

The second suspension 16th January: Westbound tracks were suspended prior to track start time due to a flight data processing system MET model issue.

The third suspension 12th May: RLatSM tracks suspended between 07:33z and 10:36z due to a global SITA network outage. This resulted in the suspension of Eastbound tracks during operation and of Westbound tracks prior to track start time. Westbound tracks were later activated on this date folliowing the end of the suspension.

Since the submission of the success criteria results presented to NAT Procedures and Operation Group (POG/01) there have been more RLatSM Westbound and Eastbound tracks published in March 2016 than in any other month. Since 1st March 2016 there has only been one day on which no RLatSM tracks were published (17th April 2016).

RLATSM PHASE 1 TRIAL STATUS

DATE: 31st May 2016

SUM-1	Target Met (Rationale)	Trial Status
	Shanwick are noting an increase of westbound flights with pre-boundary logon issues prior to entry being reported by the operation during the period since POG/01 (mid March), resulting in a manageable increase in controller workload. Engineering connection issues are being tracked, and resolutions being investigated and actioned through the DLMA and TIG. *No indication that there are any specific issues, but that education and investigations should continue to mitigate against the these failures.* *Of the 19000 flights cleared in Shanwick on RLatSM tracks as part of Phase 1 of the trial, Shanwick have received reports from the operation of 22 events that have resulted in flights with connectivity issues that required Shanwick controller action for the maintenance of the required separation.* *On the basis of the data so far, the indication is that the trial is not having adverse safety impact to the service being provided by Gander and Shanwick.* *Both Shanwick and Gander operations are continuing to work closely with customers with regards to the use of 'confirm assigned route' (UM137) which is being uplinked tactically by controllers. Results showing less than the required 90% success rate to proceed to automate this message.*	PASS

SAFETY					
Ident	**Rationale**	**Target**	**Method of measuring**	**Target Met (Rationale)**	**Trial Status**
SF1-1	Ensure that the collision risk is not adversely affected by the application of 25nm lateral separation instead of 60nm + Gentle Slope, and that there are no significant negative trends in lateral error types due to the application of 25nm lateral separation and establishment of half degree OTS.	Vertical collision risk does not increase.	Scrutinise each vertical error to determine if the application of 25nm instead of 60nm + gentle slope rules had an effect on the error. If such an effect is found then quantify the effect on the lateral risk.	MWG Assessment of the impact of RLatSM on the collision risk based on 2016 data will be included in the next year MWG 2017 report. This is dependent on additional data from Scrutiny group to perform this assessment. An interim assessment based on the first six months of 2016 will be completed before October 2016 after the Scrutiny group goes through the reported safety incidents. Subject to findings and based upon current statistics the project team consider the trial status as PASS, noting that there have been no reported incidents relating to vertical error on the RLatSM tracks.	PASS
SF1-2		Longitudinal collision risk does not increase	Scrutinise each longitudinal error to determine if the application of 25nm instead of 60nm + gentle slope rules had an effect on the error. If such an effect is found then quantify the effect on the lateral risk.	Based upon unit incident reports no evidence exists to suggest an increase in Longitudinal risk along RLatSM OTS. As the MWG does not presently have a longitudinal collision risk model, it will not be in a position to assess the RLatSM impact on longitudinal risk. Based upon unit reports received, the Project team considers the trial status as PASS.	PASS

SAFETY					
Ident	**Rationale**	**Target**	**Method of measuring**	**Target Met (Rationale)**	**Trial Status**
SF1-3		Lateral collision risk does not increase	Scrutinise each lateral error to determine if the application of 25nm instead of 60nm + gentle slope rules had an effect on the error. If such an effect is found then quantify the effect on the lateral risk.	MWG Assessment of the impact of RLatSM on the lateral collision risk based on 2016 data will be included in the next year MWG 2017 report. This is dependent on additional data from Scrutiny group to perform this assessment. An interim assessment based on the first six months of 2016 will be completed before October 2016 after the Scrutiny group goes through the reported safety incidents. Subject to findings and based upon current statistics the *RLAT phase 2 Transition Project team* consider the trial status as PASS, noting that there have been no reported incidents relating to lateral error on the RLatSM tracks.	PASS
SF1-4		No significant negative trend in the lateral error types.	Compare lateral error reports from internal investigations and CMA reports and compare with same period last year.	The RLAT phase 2 Transition Project team consider no significant negative trends in lateral error types based upon the fact there have been no reported lateral incidents within the RLAT environment during first 24 weeks of trial. This is a conditional PASS subject to aforementioned SG and MWG interim assessment. No reported lateral errors on RLatSM tracks.	PASS

SAFETY					
Ident	**Rationale**	**Target**	**Method of measuring**	**Target Met (Rationale)**	**Trial Status**
COM1-1 Comments:					

CPDLC 'Confirm Assigned Route,' and ADS-C Pre-boundary demand introduced in support of this trial are proving successful in providing early indication and intervention to prevent Gross Navigation Errors throughout the operation.

Note that CPDLC 'Confirm Assigned Route' successful responses remain below 90%, Shanwick and Gander processes being followed to improve this figure through direct crew and operator communication and logging of defects to DLMA.

Several references to the MWG are contained in the RLatSM Phase 1 success criteria tables contained in the POG Summary of Discussions of the March 2016 meeting, specifically Appendix G – SF1-1, SF1-2, and SF1-3 pertaining to the impact of RLatSM on the vertical, longitudinal and lateral collision risk.

The MWG will perform these impact assessments as part of its Terms of Reference and report this to the SOG at its next annual meeting in spring of 2017 provided the following additional required deviation data are available:
a) Identifying all RLatSM deviations including deviation direction (requested by the MWG at NAT Scrutiny Group/13) ; and
b) Identifying when the use of RLatSM contributed to the occurrence of a Large Height Deviation (LHD) event so that the impact of RLatSM on the vertical risk (SF1-1) can be assessed (the MWG will be requesting the NAT Scrutiny Group to include this).

As the MWG does not presently have a longitudinal collision risk model, it would not be in a position to assess the RLatSM impact on longitudinal risk (SF1-2).

The MWG would be prepared to provide an interim RLatSM performance assessment (not a risk assessment) based on the first six months of 2016 provided that:
a) The MWG is asked to do so by the SOG;
b) The required deviation data is made available to the MWG by the SG (post SG/15 scheduled in September); and
c) MWG resources are available to complete the interim assessment.

Based upon the MWG comment, the RLatSM Phase 2 Transition Project team conditionally recommend that SF 1-1 To SF 1-4 does not impact upon the RLatSM trial progression to Phase 2, backed up by no reports of deviations received within the RLatSM environment.

SAFETY					
Ident	**Rationale**	**Measure**	**Data Requirements**	**Target Met (Rationale)**	**Trial Status**
SF1-5	Ensure that there are no adverse safety events due to the trial.	Monitor operator failures to correctly indicate RNP4 authorisations and ADS-C / CPDLC capability resulting in ineligible flights being placed on RLatSM tracks.	Scrutinise each occasion where a flight is cleared onto and enters the NAT on an RLatSM track when not equipped to be there. Provide summary of incidents that occurred and any evidence relating to whether or not had an adverse impact on safety.	1 report (from 19000 flights) of being cleared onto an RLatSM track when flight plan indicated not equipped. 26th December – Report submitted by controller that flight requested RLatSM track when flight plan indicated non RNP4. Crew advised RNP4 certified resulting in controller updating flight record in GAATS+ and clearance issued on whole degree RLatSM track. Shanwick and Gander procedures aligned such that only flights that correctly indicate RNP4 certification on flight plan submission will be eligible for RLatSM OTS clearance.	PASS
SF1-6		Monitor the failures to properly achieve FANS logon, or to maintain or transfer CPDLC connection and ADS-C contract resulting in ATC reverting to another form of separation.	Provide information as to the source and cause of the error that resulted in the requirement to apply another form of separation while the flight was in the NAT.	22 Shanwick reports of flights requiring the application of another form of separation following ADS / CPDLC connection issues summarised below. **December** 1 Westbound flight lost ADSC/CPDLC connection after OCA entry. Co-ordination agreed between Gander and Shanwick to remain on RLatSM track as per procedures. Datalink investigations raised and being treated as individual airframe issue.	PASS

				February 1 Eastbound flight lost ADS capability after entry into Shanwick OCA. Shanwick ATC kept the flight on RLATSM track as per procedures. No options were available to move traffic to apply standard lateral separation. **March** 1 Eastbound flight could not establish connection with Shanwick at 30 west and was climbed to a flight level enabling standard lateral separation. 5 Westbound flights suffered connectivity issues within domestic airspace prior to Oceanic entry of which: 1 flight lost CPDLC connectivity prior to OCA entry and re-cleared by domestic prior to entry within RLAT OTS at flight level providing 1 degree lateral separation 1 flight was unable to establish ADS/CPDLC contracts at entry. ATC action from Shanwick and Gander required to climb flights to achieve standard lateral separation within RLAT OTS. 2 flights did not logon to CPDLC by entry point Due to pre-boundary warnings, domestic ATC were instructed to issue a reroute flight to an adjacent OTS, establishing standard lateral separation by 20 West.	

				1 flight failed to log onto CPDLC within Shanwick OCA on RLAT Track. Flight rerouted and established standard separation at 30W. **April** 4 reports of flights either being recleared to another level or other action taken to resolve separation. 2 Eastbound and 2 Westbound flights. **May** 10 reports of flights either being recleared to another level or other action taken to resolve separation. 2 of which were due to Westbound preboundary log on issues. The remaining eight reports included three Eastbound and five Westbound datalink failures.	
SF1-7		Continual monitoring of RCP240 / RSP180.	Each ANSP continues to monitor performance in support of TIG where validation of the results takes place at the Spring meetings.	RCP/RSP performance as per TIG/01. No indication of drop in performance.	PASS

SAFETY					
Ident	**Rationale**	**Measure**	**Data Requirements**	**Target Met (Rationale)**	**Trial Status**
SF1-8		Monitor operator failures to correctly input half degree coordinates into the FMS for flights cleared on the half degree RLatSM track.	Provide information on each failure to determine the method used to input the coordinates and the cause of the error.	No flights captured incorrectly entering half degree co-ordinates.	PASS
SF1-9		Monitor operator failures to correctly input whole degree coordinates into the FMS for flights cleared on the whole degree RLatSM track.	Provide information on each failure to determine the method used to input the coordinates and the cause of the error.	No flights captured incorrectly entering whole degree co-ordinates.	PASS

COM 1-2 Comments:

Note that improved conformance monitoring through CPDLC ; 'Confirm Assigned Route' and ADS-C; Pre-boundary demand reports providing early indication and intervention to prevent Gross Navigation Errors throughout the operation. None of the errors captured have been on the RLatSM OTS.

One flight requesting track with incorrect flight plan indication. Shanwick procedures have since been amended to align with Gander such that only flight plan indications of RNP4 will be cleared on RLatSM tracks.

Based upon Shanwick ATC reports since the beginning of May, there has been a noted increase in the number of reported CPDLC and ADS-C connection losses requiring controller intervention to achieve where possible Non-RLAT forms of separation. As of May 31st Shanwick have reported 22 such instances since the beginning of the trial. Datalink failures reported include flights failing to properly achieve FANS logon, unable to maintain or transfer CPDLC connection and ADS-C contract.

The TIG/1 meeting reviewed the respective ANSP analysis for RCP240 CPDLC and RSP180 ADS-C performance using the agreed standard common template. All reports consistently showed that the 95% criterion of the ADS-C Required System Performance (RSP) 180 and CPDLC Required Communication Performance (RCP) 240 requirements were met, but the 99.9% criterion was mostly not met

Data-link failures create increased workload for controllers who are required to manage the failure through ATC procedures accordingly. Within the RLAT 1 environment this workload is manageable, however it is very important that continued education and investigation relating to connection issues takes place, and further improvements to this aspect of the operation are made. Datalink connections are fundamental for the success of the RLAT 2 phase of the trial.

Based upon this information the RLatSM Phase 2 Transition Project team conditionally recommends that targets SF 1-5 To SF 1-9 currently are met and do not impact upon the RLatSM trial progression to Phase 2

APPENDIX C — DRAFT COMMON LANGUAGE AERONAUTICAL INFORMATION CIRCULAR (AIC)

(paragraph 3.1.11 refers)

AERONAUTICAL INFORMATION CIRCULAR

NOTICE OF PLANNED EXPANSION OF THE TRIAL IMPLEMENTATION OF 25 NAUTICAL MILE LATERAL SEPARATION MINIMUM IN THE ICAO NORTH ATLANTIC REGION

Introduction

The first phase of the reduced lateral separation minimum (RLatSM) of 25 nautical miles (NM) in the North Atlantic (NAT) region commenced 15 December 2015. As of that date, all flights operating between flight level (FL) 350 and FL 390 inclusive on the three published RLatSM tracks within the Gander and Shanwick oceanic control areas (OCA) and have participated in the trial.

Phase 2 will expand the implementation throughout the entire of the NAT organized track system (OTS) between FL 350 and FL 390 inclusive.

As notified in State letter EUR/NAT 16-XXXX.TEC (dated dd/mm/ 2016), RLatSM Phase 2 will begin on or soon after dd/mm/yyyy.

Background

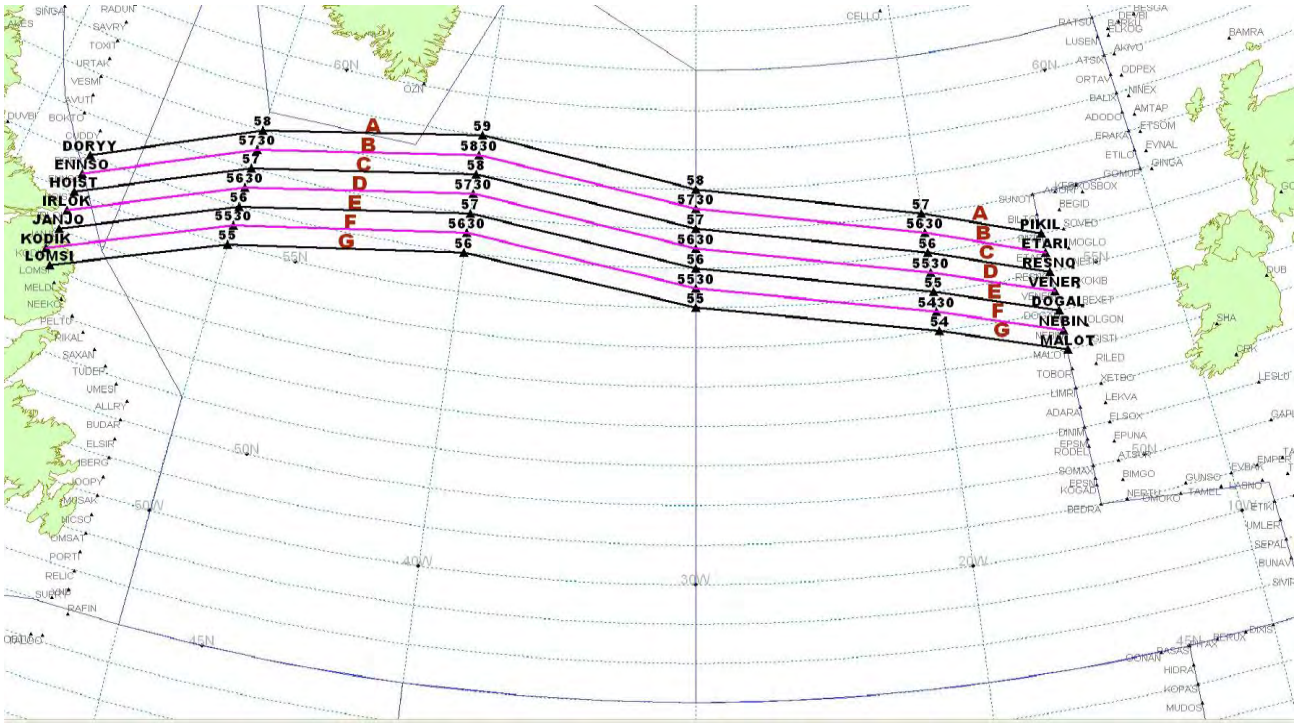
Advancements in aircraft avionics and air traffic management flight data processing systems have driven an initiative to analyze whether the lateral separation standard in the current North Atlantic (NAT) minimum navigation performance specification (MNPS) airspace (one degree of latitude, which equates nominally to 60 NM) can be reduced to increase the number of route options available and therefore increase capacity at optimum flight levels.

Operator Eligibility and Participation

Aircraft operating on or at any point along the published RLatSM tracks (see example diagram below) within the NAT OTS between FL 350 to FL 390 inclusive during the OTS validity period are required to be fitted with, and using, controller-pilot data link communications (CPDLC) and Automated Dependent Surveillance–Contract (ADS-C) equipment (see North Atlantic Operations Bulletin 2012-031).

The trial implementation of RLatSM will occur in NAT HLA airspace; therefore HLA approval remains a requirement. Only those operators/aircraft eligible for RLatSM operations will be allowed to operate on designated RLatSM tracks between FL 350-390 (inclusive). All RLatSM tracks and FLs will be uniquely identified in Note 3 of the OTS Track Message

Flights operating on or at any point along published RLatSM tracks will be permitted to request a climb or descent outside the FL350 to FL390 level band, clearances being subject to tactical traffic situations. However 60 NM lateral separation will then be applied.



Operators will be eligible to flight plan RLatSM tracks provided the flights are:

a) RNP4 approved;

b) Automated Dependent Surveillance–Contract (ADS-C) equipped; and

c) controller-pilot data link communications (CPDLC) equipped.

The required CNS systems must be operational and flight crews must report any failure or malfunction of global positioning system (GPS), ADS-C, or CPDLC equipment to air traffic control (ATC) as soon as it becomes apparent.

Contingency and Strategic Lateral Offset Procedures

Contingency procedures applicable in the NAT Region are contained in Chapter 15 (15.2 Special Procedures for In-Flight Contingencies in Oceanic Airspace) of the Procedures for Air Navigation Services – Air Traffic Management (Doc 4444), Chapter 9 (Special Procedures) of the NAT Regional Supplementary Procedures (SUPPS) (Doc 7030) and Chapter 13 (Special Procedures for In-Flight Contingencies) of the North Atlantic Operations and Airspace Manual (NAT Doc 007). Analysis conducted as part of the RLatSM safety assessment has confirmed these procedures remain appropriate for the application of the 25 NM lateral separation minimum. Therefore, no additions or changes to the existing procedures are required.

The strategic lateral offset procedure (SLOP) which distributes aircraft along a route or track centerline with offsets of one or two miles to the right thereof has been implemented as a standard operating procedure in the NAT Region since 2004. Detailed guidance on SLOP application in the NAT Region is contained in Chapter 8 (8.5 Special In-Flight Procedures Strategic Lateral Offset Procedures (SLOP)) of the North Atlantic Operations and Airspace Manual (NAT Doc 007). Calculations used in the RLatSM safety assessment demonstrate sufficiency to allow provisions for the application of SLOP up to 2 NM right of track or route centerline where the 25 NM lateral separation minimum is being applied.

Operators may note that current procedures in the Procedures for Air Navigation Services – Air Traffic Management (Doc 4444) indicates offsets up to 2 NM are only to be used where lateral separations of 30 NM or more are being applied. Based on similar calculations as those conducted for the RLatSM safety assessment, the Doc 4444 SLOP provisions are planned to be amended in 2016 to document that offsets up to 2 NM may be used where lateral separations of 23 NM or more are being applied. Therefore no additions or changes to the existing SLOP provisions in the NAT Region are required.

Flight Planning

Air traffic services (ATS) systems use Field 10 (Equipment) and Field 18 (Other Information) 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 for RNP 4 authorized and FANS 1/A or equivalent aircraft:

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

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

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

insert "D1" to indicate ADS with FANS 1/A capabilities;

c) Field 18 (Other Information);

insert the characters "PBN/" followed by "L1" for RNP 4.

Correct use of the CNS equipment that is indicated in the flight plan

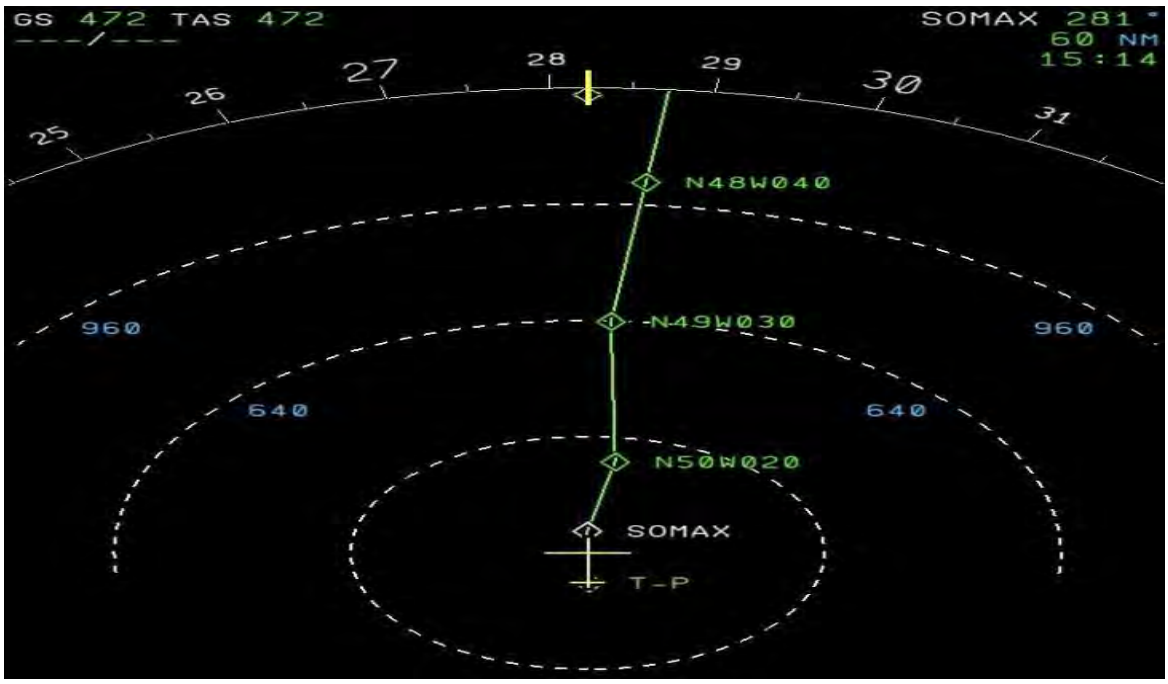
Before entering the NAT, the flight crew should ensure that:

a) the aircraft is logged on for data link capability (J5, J7, D1) filed in the FPL; and

b) RNP 4 is inserted into the Flight Management Computer (FMC), when RNP4 capability (L1) has been filed in the FPL. This is necessary to enable aircraft navigation system monitoring and alerting against the required RNP 4 navigation specification.

Verification of Waypoint Degrees and Minutes

Track spacing for RLatSM may involve the use of waypoints comprised of half degree coordinates. Existing cockpit map display limitations result in truncation of waypoints comprised of latitude/longitude to a maximum of seven characters; minutes of latitude are not displayed. In the example below, the representation would be the same if the flight was operating along whole or half degree waypoints (e.g., the N50W020 label in the figure below could represent a whole degree (5000 North) or a half-degree (5030 North) of latitude)



As shown below, full 13-character representations of latitude/longitude waypoints can be viewed via the FMC display. To mitigate the possibility for gross navigation errors resulting from incorrect waypoint insertion, it is imperative that established cockpit procedures are followed whereby each pilot independently displays and verifies the degrees and minutes loaded into the FMC for each oceanic waypoint defining the cleared route of flight.

Flight crews are further advised that, should they be notified that ATC systems indicate the aircraft is not flying the cleared route, they should immediately display of the full degrees and minutes loaded into the FMC for the NEXT and NEXT + 1 waypoints, and verify against the cleared route before responding.

As a precaution against possible waypoint insertion errors, rerouting of flights onto RLatSM identified tracks containing ½ degree coordinates will only be permitted via CPDLC using Uplink Message UM79, UM80 or UM83. Aircraft will therefore not be rerouted onto ½ degree OTS tracks if ARINC 623 data link or voice is used for the issuance of the oceanic clearance..

Current Version

The current, and updated versions of the **draft NAT RLatSM plan and associated documents** are provided on the ICAO European and North Atlantic Office website:

<www.icao.int/EURNAT/>,
EUR & NAT Documents
NAT Documents
Planning documents supporting separation reductions and other initiatives

Further Information

For further Information, please contact:

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APPENDIX D — UPDATE TO THE NAT RLATSM OPS BULLETIN 2015_003 (REV1)

(*paragraph 3.1.11 refers*)

NAT OPS BULLETIN

Serial Number: Effective:
Subject: RLatSM Special Emphasis Items – Phase 2 Update

This bulletin updates North Atlantic Operations Bulletin (NAT OPS) Bulletin 2015_003 Revision 1. The purpose of the bulletin is to provide guidance to North Atlantic (NAT) operators on material to be included in pilot and dispatcher training programs and operations manuals to prepare them for operations in the North Atlantic under Reduced Lateral Separation of 25 Nautical Miles. (NAT RLatSM).

Grey shading in the bulletin indicates modifications or additions to NAT OPS Bulletin 2015_003 Rev 1 text.

RLatSM Phase 2 start. The bulletin provides information on RLatSM Phase 2 which is planned to start on or about 10 November 2016 in portions of the Gander, Shanwick and Reykjavik Oceanic Control Areas (OCA). The start date for RLatSM Phase 2 will be confirmed later this year when the assessment of RLatSM Phase 1 operations is completed.

Re-naming NAT Minimum Navigation Performance Specifications (MNPS) Airspace as NAT High Level Airspace (HLA). Operators are reminded that NAT MNPS Airspace was re-named as NAT HLA on 4 February 2016. (See NAT OPS Bulletin 2016_01 (Re-naming of the NAT MNPSA to NAT HLA). It can be found on the ICAO EUR/NAT Office Website. See paragraph 6 below (Websites).

This Bulletin may be updated, as necessary, as progress is made toward the start date for **Phase 2** of the RLatSM trial.

***Any queries about the content of the attached document should be addressed to**:*

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NAT OPERATIONS BULLETIN – RLATSM SPECIAL EMPHASIS ITEMS

1. Purpose of Bulletin – RLatSM Phase 2 Update. The purpose of this bulletin is to provide guidance to North Atlantic (NAT) operators on material to be included in pilot and dispatcher training programs and operations manuals to prepare them for operations in the North Atlantic under Reduced Lateral Separation of 25 Nautical Miles (NAT RLatSM operations). It also provides updated information on the start of RLatSM Phase 2 trials.

1.1 This Bulletin may be updated, as necessary, as progress is made toward the start date for Phase 2 of the RLatSM trial. Any necessary updates will be distributed through industry organizations and posted on the ICAO EUR/NAT Website. (See section 6).

1.2 Operator attention is directed to Attachment A. It provides a "quick reference" for the RLatSM Special Emphasis Items contained in this bulletin. It is intended to be used as a job aid for operators developing pilot and dispatcher training material.

1.3 The following is an explanation of the terms "should", "must" and "shall" as used in this bulletin.

a) "Should" is used to indicate a recommended practice or policy that is considered as desirable for the safety of operations.

b) "Shall" and "must" are used to indicate a practice or policy that is considered as necessary for the safety of operations.

2. RLatSM Project Plan Overview. Phase 1 of the NAT 25 NM Reduced Lateral Separation Minimum (RLatSM) trial commenced in portions of the Gander and Shanwick oceanic control areas (OCA) in December 2015. The RLatSM Phase 2 trial is planned to be implemented in portions of the Gander, Shanwick and Reykjavik OCAs on or about 10 November 2016. (The start date for RLatSM Phase 2 will be confirmed later this year when the assessment of Phase 1 operations is completed).

a) **During the RLatSM Phase 1 trial,** the 25 NM lateral separation minimum is implemented by applying ½ degree track spacing between **three core** NAT Organized Track System (OTS) tracks. 25 NM lateral separation is applied between flight level (FL) 350-390 (inclusive).

b) **During Phase 2 of the RLatSM trial,** the 25 NM lateral separation minimum will be implemented by applying ½ degree track spacing between **all NAT Organized Track System (OTS) tracks.** 25 NM lateral separation will be applied between flight level (FL) 350-390 (inclusive).

c) OTS tracks separated using the reduced lateral separation minimum are established by publishing OTS tracks defined by ½ degree waypoints (e.g., 54 degrees-30 minutes NORTH latitude/50 degrees WEST longitude) between two adjacent tracks defined by whole degree waypoints (e.g. 54 degrees NORTH latitude/50 degrees WEST longitude, respectively).

Note: operators are advised that due to pre-tactical considerations, standard laterally separated tracks (60nm) may be contained within the NAT OTS structure. RLatSM tracks will be designated tracks identified in "Remark 3" of the NAT Track Message.

d) Only those operators/aircraft eligible for RLatSM operations are allowed to operate on designated RLatSM tracks between FL 350-390 (inclusive). See Section 3 (Operator/Aircraft Eligibility).

e) Strategic Lateral Offset Procedures (SLOP) are to be used in accordance with NAT Doc 007, paragraph 8.5

f) Enhanced ATC surveillance and communication is provided via FANS 1/A (or equivalent) data link systems. Automatic Dependent Surveillance (ADS-C) provides route conformance monitoring, periodic aircraft reporting and controller alerts for Lateral Deviation Events (LDE) and vertical deviation events (Level Range Deviation Events (LRDE). Controller-Pilot Data Link Communications (CPDLC) enhances ATC intervention and communication capabilities.

3. Operator/Aircraft Eligibility. Operators do not need to apply to NAT ANSPs to be part of the trial, however, operators should consult with the State authority responsible for their operation prior to starting RLatSM operations. Operators are eligible to flight plan and fly RLatSM tracks provided the flights are:

a) Authorized Required Navigation Performance 4 (RNP 4)

b) ADS-C and CPDLC equipped and, where applicable, authorized; and,

c) Operating required Communications, Navigation and Surveillance (CNS) systems.

Note: Job Aids for RNP 4 and Data Link operations authorization are posted on the ICAO European and North Atlantic (EUR/NAT) Office website. See section 6 (**Websites**).

4. Flight Planning Provisions

4.1 Only those operators/aircraft eligible for RLatSM operations are allowed to operate on designated RLatSM tracks between FL 350-390 (inclusive). All RLatSM tracks and FLs are uniquely identified in Remark 3 of the OTS Track Message as shown below:

Westbound NAT Track Message Example: Phase 2 RLatSM Tracks

Note: See "Remark 3". Tracks A, B, C, D and E are designated as RLatSM tracks between FL 350-390.

FF CYZZWNAT
102151 EGGXZOZX
(NAT-1/3 TRACKS FLS 310/390 INCLUSIVE
FEB 11/1130Z TO FEB 11/1900Z
PART ONE OF THREE PARTS-
A PIKIL 57/20 58/30 59/40 58/50 DORYY
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
B ETARI 5630/20 5730/30 5830/40 5730/50 ENNSO
EAST LVLS NIL
WEST LVLS 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
C RESNO 56/20 57/30 58/40 57/50 HOIST
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
END OF PART ONE OF THREE PARTS)
FF CYZZWNAT
102151 EGGXZOZX
(NAT-2/3 TRACKS FLS 310/390 INCLUSIVE
FEB 11/1130Z TO FEB 11/1900Z
PART TWO OF THREE PARTS-
D VENER 5530/20 5630/30 5730/40 5630/50 IRLOK
EAST LVLS NIL
WEST LVLS 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
E DOGAL 55/20 56/30 57/40 56/50 JANJO
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
END OF PART TWO OF THREE PARTS)
FF CYZZWNAT
102152 EGGXZOZX
(NAT-3/3 TRACKS FLS 310/390 INCLUSIVE
FEB 11/1130Z TO FEB 11/1900Z
PART THREE OF THREE PARTS-
REMARKS.
1. TMI IS 042 AND OPERATORS ARE REMINDED TO INCLUDE THE
TMI NUMBER AS PART OF THE OCEANIC CLEARANCE READ BACK.
2. ADS-C AND CPDLC MANDATED OTS ARE AS FOLLOWS
TRACK A 350 360 370 380 390
TRACK B 350 360 370 380 390
TRACK C 350 360 370 380 390
TRACK D 350 360 370 380 390
TRACK E 350 360 370 380 390
END OF ADS-C AND CPDLC MANDATED OTS
3. RLATSM OTS LEVELS 350-390. RLATSM TRACKS AS FOLLOWS
TRACK A
TRACK B
TRACK C
TRACK D
TRACK E
END OF RLATSM OTS...

4.2 Operators must file the correct ICAO Flight Plan annotations in Items 10 and 18 to indicate that RLatSM required CNS systems are operational for the flight.

a) Item 10a (Radio communication, navigation and approach aid equipment and capabilities).

- Inset "X" to indicate that the aircraft meets requirements for NAT HLA operations. (See page 1 for information on accessing NAT OPS Bulletin 2016_1. It contains guidance on NAT HLA requirements);
- Insert "J5" to indicate FANS 1/A (or equivalent) Inmarsat CPDLC SATCOM and/or "J7" to indicate FANS 1/A (or equivalent) CPDLC Iridium SATCOM data link equipage and operation;
- Insert "R" to indicate that aircraft navigation system equipage and operation are Performance Based Navigation (PBN) approved. See 4.2 c) below on the related Item 18 entry for RNP 4.

b) Item 10b (Surveillance equipment and capabilities)

- Insert "D1" to indicate FANS 1/A (or equivalent) ADS-C equipage and operation

c) Item 18 (Other information)

- Insert the characters "PBN/" followed by "L1" to indicate RNP 4 authorization.

5. Special Emphasis Items for RLatSM Operators. The Special Emphasis Items (SEI) listed below should be incorporated into operator training programs and operations manuals with the intent of raising pilot and dispatcher awareness of the importance of following procedures in an environment where ½ degree waypoints and a lateral separation minimum of 25 NM are applied. Each SEI is followed by an explanation of the factors leading it to be identified as an RLatSM SEI.

5.1 ***Requirement to use the CNS equipment that is indicated in the ICAO flight plan:***

ATC uses the Flight Plan annotations in Items 10 and 18 to apply the reduced separation between aircraft. Therefore, before entering the NAT, the pilot must ensure that:

1. the aircraft is logged on when data link capability (J5, J7, D1) has been filed in the FPL; and
2. RNP 4 is inserted into the FMC, when RNP4 capability (L1) has been filed in the FPL. This is to enable aircraft navigation system monitoring and alerting against the required RNP 4 Navigation Specification.

5.2 ***Pilot Training on Map and FMC Displays of ½ Degree and Whole Degree Waypoints:***

To mitigate misinterpretation of waypoint coordinates, operator initial and re-current training programs and operations manuals must incorporate training and guidance to enable pilots to understand map and FMC displays of ½ degree and whole degree waypoints regardless of the waypoint format being used for waypoint FMC input. See paragraph 5.3 below.

Explanation

5.3 Map displays and certain FMC pages generally do not display full waypoint degrees <u>and</u> **minutes, e.g. when the full 13 latitude/longitude characters are used to insert ½**

degree waypoints. See Figure 1 **and** Figure 2 **in Attachment B.**Error! Reference source not found.***Aircraft Navigation Database (NDB) Waypoint Identifiers:***

In 2015, Canada, the United Kingdom (UK), and Iceland published Aeronautical Information Circulars (AIC) strongly advocating that aircraft NDB vendors and flight planning services **not** provide operators with half-degree waypoint identifiers in the ARINC 424, paragraph 7.2.5

"N-prefix" format (*e.g., N5250 = 52°30' NORTH 050°00'WEST).* (See Canada AIC 23/15 (23 July 2015, UK AIC 059/2015 (9 July 2015) and Iceland AIC A009/2015 (18 September 2015). The guidance in these circulars will be incorporated into the Aeronautical Information Publications (AIP) of the respective organizations in the future).

NAT operators should use a full latitude/longitude (e.g., 13-character) input for waypoints containing both half-degree and whole degrees of latitude and whole degrees of longitude.

NAT operators **with an operational need to populate the aircraft NDB** with a 5-character waypoint identifier should ensure that the aircraft NDB vendors and flight planning services use an alternate half-degree of latitude 5-character format such as Hxxyy, where xx = degrees and 30 minutes of NORTH latitude and yy = degrees of WEST longitude *(e.g., H5250 = 52°30' NORTH 050°00' WEST).* (It is recognized that, for whole degree waypoint inputs, such operators will likely continue using the ARINC 424, 7.2.5 "N-suffix" format *(e.g., 5250N = 52° 00' NORTH 050°00'WEST)).*

Rerouting of flights onto RLatSM identified tracks containing ½ degree coordinates will only be permitted using a CPDLC route clearance uplink. Aircraft will therefore not be re-routed onto ½ degree OTS tracks if ARINC 623 data link or voice is used for the issuance of the oceanic clearance.

The CPDLC route clearance will be uplinked in a full Lat/Long format that will be unfamiliar to the flight crews using an ARINC 424, 7.2.5 format. Operators **with an operational need to populate the aircraft NDB** with a 5-character waypoint identifier format need to ensure flight crews are properly trained on the use of the full Lat/Long waypoint format in uplink messages. They must also emphasize the necessity for proper waypoint verification procedures.

Explanation

5.3.1 Half-degree waypoint identifiers in the ARINC 424, paragraph 7.2.5 "N-prefix" format have led to a number of Gross Navigation Errors (GNEs) and Lateral Deviations. The guidance for waypoint insertion in paragraph 5.3 above is intended to remove the potential for such errors. They occur when a pilot intending to input a waypoint defined by a half-degree of latitude inadvertently loads a waypoint containing a whole-degree of latitude, or vice versa, because the "N" is not loaded in the correct pre-fix or suffix position.

5.4 ***Pilot Procedures for Verifying Waypoint Degrees and Minutes Inserted into Aircraft Navigation Systems:***

Procedures must be used to display and verify the DEGREES and MINUTES loaded into the Flight Management Computer (FMC) for the "un-named" (Lat/Long) waypoints defining the route contained in the oceanic clearance. (The "Sample Oceanic Checklist" NAT OES Bulletin refers).

Regardless of FMC waypoint format and entry method, crew procedures should be designed to promote strong crew resource management techniques, to prevent opportunities for error occurring as a result of confirmation bias and to generally maintain

an attitude of healthy suspicion. Accordingly, the waypoint verification procedures should be conducted as detailed below.

- During pre-flight LRNS programming, both pilots independently verify the full latitude and longitude coordinates of "un-named" (Lat/Long) waypoints defining the expected route of flight within oceanic airspace as entered in the FMC.
- Upon receipt of a revised oceanic clearance (i.e., one not conforming to the flight planned route), both pilots independently verify the full latitude and longitude coordinates of "un-named" (Lat/Long) waypoints defining the route contained in the revised oceanic clearance.
- Approaching an oceanic waypoint, one pilot should verify the full latitude and longitude coordinates of that waypoint in the FMC, the NEXT and NEXT +1 waypoints, while the other pilot crosschecks the latitude and longitude coordinates against the master flight plan/oceanic clearance.

Explanation

5.4.1 Due to the factors in the map and FMC display of ½ degree and whole degree waypoints, it is imperative that pilots follow the procedure in paragraph 5.4 above to avoid lateral errors caused by incorrect insertion of waypoints. Verification of the full DEGREES and MINUTES of oceanic waypoints loaded into the FMC is a critical step in ensuring a proper navigational load.

5.5 ***Pilot Track and Distance Check:***

It is strongly recommended that pilot pre-flight and in-flight procedures call for the pilot to compare the track and distance between waypoints shown on the Computer Flight Plan (CFP) to those displayed by the FMC. (The NAT "Sample Oceanic Checklist" Bulletin refers).

Pilots should be aware that waypoint insertion errors of ½ degree of latitude may in some cases result in only small differences in track and distance, however, the track and distance check can help prevent waypoint insertion errors of one degree or more that have been observed in oceanic operations.

Note: `the currency of magnetic variation tables loaded into aircraft navigation databases and the point at which the track is measured affect the track displayed on the FMC by as much as ±3 degrees.

Explanation

5.5.1 This check remains valuable for RLatSM operations because waypoint insertion errors are **not** limited to ½ degree errors and waypoint insertion errors of one degree or more have been observed in oceanic operations. Waypoint insertion errors of ½ degree produce a small difference in leg segment track and distance, however, as noted above, waypoint insertion errors are not limited to ½ degree.

5.6 ***Pilot Action When Notified By ATC of Possible Deviation from Cleared Track:***

Flight crews are advised that, should they be notified that ATC systems indicate the aircraft is not flying the cleared route, they should immediately display the full degrees and minutes loaded into the FMC for the NEXT and NEXT + 1 waypoints, and verify against the cleared route before responding.

Voice message example: "SHANWICK CONFIRMS YOUR POSITION REPORT INDICATES INCORRECT ROUTING. CHECK FULL DEGREES AND MINUTES LOADED INTO FMC. YOUR CLEARED ROUTE IS [route]"

CPDLC message example:

YOUR POSITION REPORT INDICATES INCORRECT ROUTING. CHECK FULL DEGREES AND MINUTES LOADED INTO FMC. YOUR CLEARED ROUTE IS [route]

When ATC notifies the pilot that the aircraft has indicated it has already deviated from the cleared track (UM169f: *ADS-C INDICATES OFF ROUTE. ADVISE INTENTIONS*), the pilot shall immediately display the full DEGREES and MINUTES loaded into the FMC for the NEXT waypoint, and verify against the cleared route.

5.7 *Policy for Operational Airborne Collision Avoidance System II (ACAS II):*

Prior to departure for flight on an NAT OTS track at a flight level where RLatSM is applied, the ACAS II system shall be fully operational for the pilot flying (i.e., the TA and RA visual display and audio function will be operative for the pilot flying). If the ACAS II system is not fully operational for the pilot flying, the operator has the option of requesting clearance to operate on a track and/or at a FL where RLatSM is not applied. **If the ACAS II system fails after departure,** the aircraft may continue on the cleared route.

Note: The ACAS II (TCAS II) system must be a Version 7.0 or more recent version).

Explanation

5.7.1 ACAS II provides a valuable situational awareness tool and safety net for pilots operating in NAT airspace including those where aircraft separation standards have already been reduced in the vertical and longitudinal dimensions. The carriage and operation of ACAS II is emphasized here in the context of RLatSM trials for the following reasons:

a) The introduction of ½ degree OTS waypoints is an operational change that introduces the use of ½ degree waypoints into NAT OTS operations. Although both pilot procedures and ADS-C conformance monitoring capabilities should mitigate the occurrence of lateral deviations related to ½ degree waypoints, ACAS II provides an independent margin of safety should lateral deviations occur during the RLatSM trial period.

b) ACAS II will provide a situational awareness tool that will enable pilots to be better prepared to safely execute weather deviation and contingency procedures necessitating lateral deviations (e.g., diversions and turn-backs). In the RLatSM operational environment, such deviations will occur in airspace where the minimum lateral separation is to be 25 NM.

5.8 *Pilot In-flight Contingency Procedures and Weather Deviation Procedures (Diversions, Turn- backs, etc.):*

In training and checking programs, operators shall place special emphasis on pilot knowledge of and preparation to execute the *Special Procedures for Inflight Contingencies in Oceanic Airspace* published in ICAO Doc 4444, paragraph 15.2 and *Weather deviation procedures* (paragraph 15.2.3).

Pilots must be aware that when crossing adjacent tracks without an ATC clearance, the potential vertical separation provided by the In-flight Contingency Procedure is 500 ft. Pilots must use all the steps called for in the Contingency Procedures to avoid conflict with other aircraft.

Pilots must also be aware that when unable to obtain an ATC clearance, Weather Deviation Procedures call for a climb or descent of 300 ft. based on direction of flight and direction of deviation, and, in addition, guidance to the pilot is to adjust the path of the aircraft, if necessary, to avoid aircraft at or near the same flight level.

Pilots must stringently follow all measures for avoiding conflict with other aircraft provided for in the Doc 4444 Contingency and Weather Deviation Procedures.

Explanation

5.8.1 The implementation of RLatSM (25 NM) separation and ½ degree track spacing

significantly reduces the distance and time a diverting aircraft has to manoeuvre when executing a diversion, turn-back or weather deviation without an ATC clearance before approaching adjacent tracks. It also reduces the time that a pilot has to obtain an ATC clearance. (An aircraft deviating from track can be in the proximity of aircraft on an adjacent track within approximately 4 minutes, depending on the angle of deviation from cleared track). In addition, as discussed above, the margin for safety for aircraft crossing adjacent tracks is 150 m (500 ft.) of vertical separation when executing In-flight Contingency Procedures.

5.9 ***RLatSM Operational policies (aircraft CNS system failure, data link system failure, etc.):***

5.9.1 **Objective.** The guidance provided in section 5.9 is intended to apply during the RLatSM trials that are scheduled to start on 12 November 2015. It is intended to supplement the Global Operational Data Link Document (GOLD) guidance to controllers and flight crew on data link service failures and aircraft data link system failures (GOLD paragraphs 4.9.4 and 5.9.4 respectively).

5.9.2 **RLatSM Required CNS System Failure Prior to Departure.** If a flight experiences a failure of an RLatSM required CNS system **PRIOR TO DEPARTURE,** the flight should flight plan so as to remain clear of NAT RLatSM tracks between FL 350-390 (inclusive).

5.9.3 **RLatSM Required CNS System Failure After Departure But Prior to Entering On To RLatSM Tracks Between FL 350-390 (Inclusive).** If a flight experiences a failure of an RLatSM required CNS system **AFTER DEPARTURE BUT PRIOR TO ENTERING RLATSM AIRSPACE,** the flight should contact ATC and request a revised clearance that will keep it clear of NAT RLatSM tracks between FL 350-390 (inclusive).

5.9.4 **RLatSM Required CNS System Failure After Entering On To RLatSM Tracks Between FL 350-390 (Inclusive).** If a flight experiences a failure of an RLatSM required CNS system **WHILE OPERATING IN RLATSM AIRSPACE**, ATC must be immediately advised. Such flights may be re-cleared to exit RLatSM airspace, but consideration will be given to allowing the flight to remain in the airspace, based on tactical considerations. (GOLD paragraph 4.9.4.8 refers).

Note: aircraft may be cleared to climb above FL 390 or descend below FL 350 and remain on half-degree tracks. However, 60 NM lateral separation will then be applied.

5.9.5 **Continuous Climb or Descent of Aircraft Not RLatSM Eligible.** Any aircraft that is not RLatSM eligible may request continuous climb or descent without intermediate level off through the vertical extent of the NAT RLatSM airspace. Such requests will be considered on a tactical basis.

5.9.6 **Altitude Reservation (ALTRV) Requests.** ALTRV requests will be considered on a case by case basis (as is done today regarding NAT High Level Airspace (HLA)), irrespective of the RLatSM eligibility status of the participating aircraft.

5.9.7 **Contingency Situations.** NAT RLatSM airspace restrictions are not applicable to aircraft experiencing a contingency situation.

5.10 ***Domestic ATC Agency Contact:***

Pilots are reminded to ensure that they contact the appropriate **domestic** ATC agency BEFORE exiting oceanic airspace.

6. Websites

6.1 The ICAO EUR/NAT Office Website is at: **www.icao.int/eurnat**. Click on **EUR & NAT Documents** >> **NAT Documents** to obtain NAT Operations and NAT Region Update Bulletins and related project planning documents.

6.2 **Job Aid Templates**. Click on **EUR & NAT Documents** >> **NAT Documents** >> Job Aid Templates for:

a) RNP 4 Job Aid Template (Application to conduct RNP 4 operations), and,

b) Data Link Job Aid Template (Operator Application to Conduct Data Link Operations).

7. Contacts

7.1 The following individuals may be contacted for information or to provide feedback on RLatSM operations:

UK NATS
Martin Donnan
GM Prestwick Operations

E-mail: **martin.DONNAN@nats.co.uk**

NAV CANADA
Gander Area Control Centre
P.O. Box 328
Gander, NL A1V 1W7
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Manager, ACC Operations
Direct line: +1 709-651-5223

E-mail: **edisonj@navcanada.ca**

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ATTACHMENT A – SUMMARY OF RLATSM SPECIAL INTEREST ITEMS CONTAINED IN THIS NAT OPS BULLETIN

1. ***Operator/Aircraft Eligibility and Flight Planning Provisions:***

Only operators that are authorized RNP 4 and equipped with and operating CPDLC and ADS-C will be eligible for RLatSM operations. In addition, the ICAO Flight Plan must be correctly annotated to indicate that RLatSM required CNS systems are operational for the flight (section 4 refers).

2. ***Requirement to use the CNS equipment that is indicated in the flight plan:***

The pilot must use that CNS systems indicated on the ICAO Flight Plan because ATC uses the Flight Plan annotations in Items 10 and 18 to apply the reduced separation between aircraft (paragraph 5.1 refers).

The pilot must also confirm that RNP4 is inserted into the FMC to enable aircraft navigation system monitoring and alerting against the required RNP4 Navigation Specification (paragraph 5.1 refers).

3. ***Aircraft Navigation Database (NDB) Waypoint Identifiers:***

Canadian AIC 23/15, UK AIC 059/2015 and Iceland AIC A009/2015 strongly advocate that aircraft NDB vendors and flight planning services **not** provide operators with **half-degree** waypoint identifiers in the ARINC 424, paragraph 7.2.5 "N-prefix" format (e.g., *N5250 = 52°30' NORTH 050°00'WEST).* (These AICs will be incorporated into State AIPs in the future).

NAT operators should use a full latitude/longitude (e.g., 13-character) input for waypoint coordinates. NAT operators **with an operational need to populate the aircraft NDB** with a 5-character waypoint identifier should ensure that the aircraft NDB vendors and flight planning services use an alternate half-degree of latitude 5-character format e.g., H5250 = *52°30' NORTH 050°00' WEST* (paragraph 5.3 refers)

4. ***Pilot Training on Map and FMC Displays of ½ Degree and Whole Degree Waypoints:***

Operator initial and re-current training programs and operations manuals must have incorporated training and guidance to enable pilots to understand map and FMC displays of ½ degree and whole degree waypoints (paragraph 5.2 and **Attachment B** Figure 1 and Figure 2 refer).

5. ***Pilot Procedures for Verifying Waypoint Degrees and Minutes Inserted into Aircraft Navigation Systems:***

Pilot Pre-flight and In-flight procedures must call for each pilot to independently display and verify the DEGREES **and** MINUTES loaded into the Flight Management Computer (FMC) for the "un-named (Lat/Long) waypoints defining the cleared route of oceanic flight. This procedure is necessary regardless of the FMC waypoint input format being used. Procedures must call for both pilots to independently verify the waypoint coordinates inserted and concur on their accuracy prior to route activation (paragraph 5.4 refers).

6. ***Pilot Track and Distance Check:***

It is strongly recommended that pilot pre-flight and in-flight procedures call for the pilot to compare the track and distance between waypoints shown on the Computer Flight Plan (CFP) to those displayed by the FMC.

Pilots should be aware that waypoint insertion errors of ½ degree of latitude may in some cases result in only small differences in track and distance, however, the track and distance check can help prevent waypoint insertion errors of one degree or more that have been observed in oceanic operations.

Note: the currency of magnetic variation tables loaded into aircraft navigation databases and the point at which the track is measured affect the track displayed on the FMC by as much as +/- 3 degrees (paragraph 5.5 refers)

7. ***Pilot Action When Notified By ATC of Possible Deviation From Cleared Track:***

When ATC notifies the pilot that ATC systems indicate that the aircraft is not flying the cleared track, the pilot shall immediately display the full DEGREES and MINUTES loaded into the FMC for the NEXT waypoint, and verify against the oceanic clearance.

8. ***Policy for Operational Airborne Collision Avoidance System II (ACAS II):***

Prior to departure for flight on in airspace where RLatSM is applied, the ACAS II system shall be fully operational for the pilot flying (i.e., the TA and RA visual display and audio function will be operative for the pilot flying). If the ACAS II system is not fully operational for the pilot flying, the operator has the option of requesting clearance to operate on a track and/or at a FL where RLatSM is not applied. **If the ACAS II system fails after departure,** the aircraft may continue on the cleared route.

Note: The ACAS II (TCAS II) system must be a Version 7.0 or more recent version) (paragraph 5.7 refers)

9. ***Pilot In-flight Contingency Procedures and Weather Deviation Procedures (Diversions, Turn-backs, etc.):***

In training and checking programs, operators shall place special emphasis on pilot knowledge of and preparation to execute the *Special Procedures for Inflight Contingencies in Oceanic Airspace* published in ICAO Doc 4444, paragraph 15.2 and *Weather deviation procedures* (PANS-ATM, paragraph 15.2.3).

Pilots must be aware that when crossing adjacent tracks without an ATC clearance, the potential vertical separation provided by the In-flight Contingency Procedure is 500 ft. Pilots must use all the steps called for in the Contingency Procedures to avoid conflict with other aircraft.

Pilots must also be aware that when unable to obtain an ATC clearance, Weather Deviation Procedures call for a climb or descent of 300 ft. based on direction of flight and direction of deviation, and, in addition, guidance to the pilot is to adjust the path of the aircraft, if necessary, to avoid aircraft at or near the same flight level.

Pilots must stringently follow all measures for avoiding conflict with other aircraft provided for in the Doc 4444 contingency procedures (paragraph 5.8 refers).

10. ***RLatSM Operational policies (aircraft CNS system failure, data link system failure, etc.):***

Operators must be aware of the RLatSM operational policies posted in paragraph 5.9 In particular, operators must be aware that all RLatSM required aircraft CNS systems must be operational PRIOR TO DEPARTURE and PRIOR TO ENTRY on to RLatSM tracks between FL 350-390 (inclusive). In addition, if RLatSM required aircraft systems fail WHILE OPERATING IN RLATSM AIRSPACE, ATC must be advised immediately so that an appropriate course of action can be determined (paragraph 5.9 refers).

11. ***Domestic ATC Agency Contact:***

Pilots are reminded to ensure that they contact the appropriate **domestic** ATC agency BEFORE exiting oceanic airspace (paragraph 5.10 5.11 refers).

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ATTACHMENT B – EXAMPLE FMC AND MAP DISPLAYS (paragraph 5.2 refers)

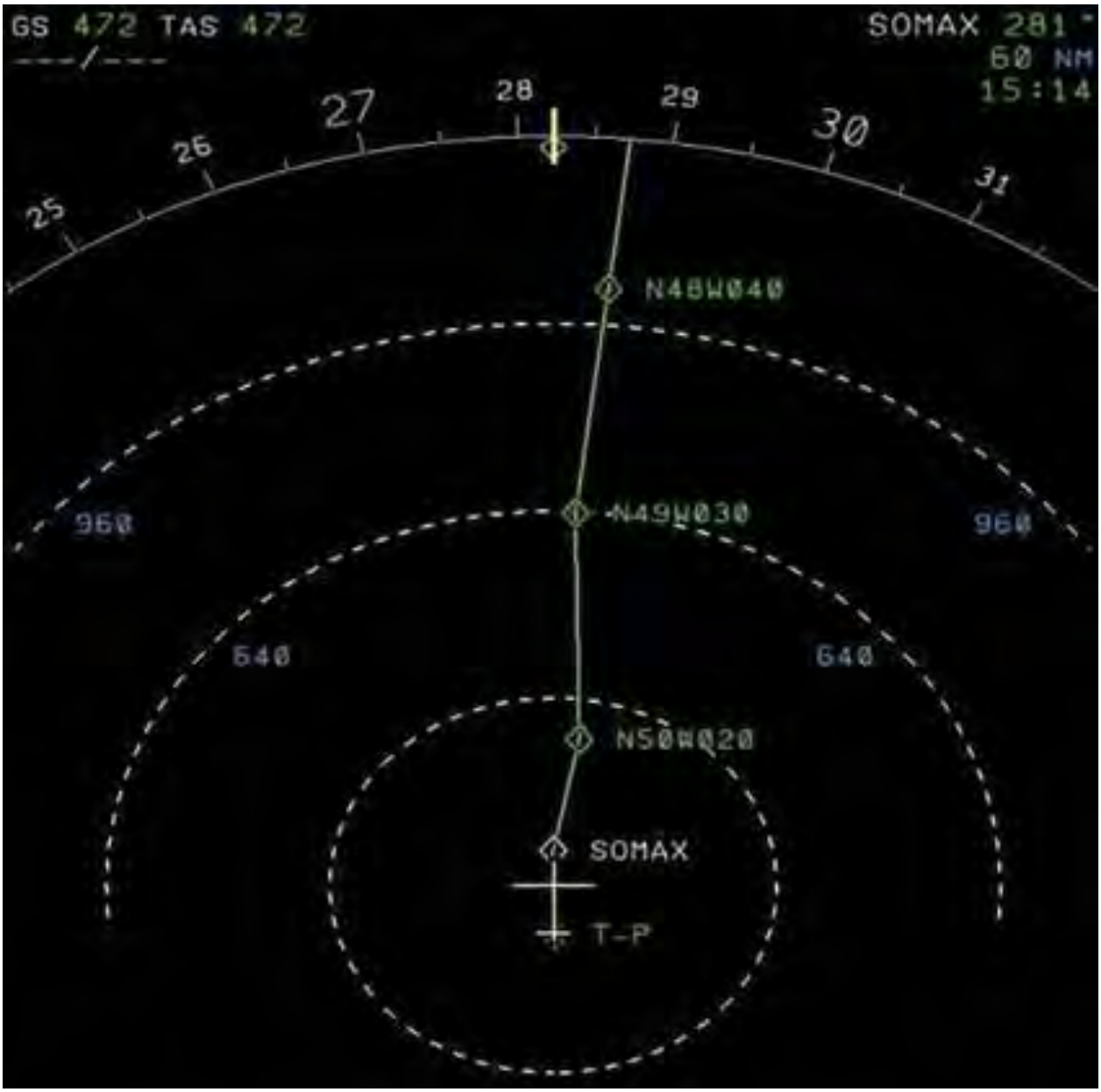
Note: Figure 1 and Figure 2 are intended to support paragraph 5.2 (Pilot training on Map and FMC Displays of ½ and Whole Degree Waypoints). **The figures emphasize that for a large number of aircraft, the input of waypoints containing whole degrees of latitude and waypoints containing half-degrees of latitude will result in identical 7-character FMC and waypoint map displays.**

Figure 1. Example FMC Display: Full Waypoint Latitude and Longitude (13-characters) inserted into FMC

1. 52 degrees-30 minutes North latitude, 20 degrees West longitude inserted into the FMC using full latitude and longitude degrees, minutes and seconds (i.e., 13 characters)

2. The waypoint IDENT is truncated to 7 characters with **no display of minutes of latitude.**

Figure 2. Example Map Display: 13-characters Inserted into FMC (Full Waypoint Latitude and Longitude)



1. 50 degrees-30 minutes North, 20 degrees West is displayed in 7 characters (N50W020).

2. **Minutes of latitude are not displayed.**

3. The Map display would be the same for 50 degrees-00 minutes North, 20 degrees West.

APPENDIX E — NAT DATA LINK PERFORMANCE REPORT 2015

(*paragraph 3.2.2 refers*)

APPENDIX ISSUED SEPARATELY

(Attached to this file)

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APPENDIX F — OPERATORS IDENTIFIED AS INCORRECTLY FILING EQUIPAGE IN THE FLIGHT PLAN

(*paragraph 3.2.6 refers*)

United Kingdom Reporting on ADS-C/CPDLC Equipage and Usage by Operator Aggregate Period: **Jan 01, 2015 to Dec 31, 2015 (12 months)**						
Operator (3-ltr ICAO Code)	**Total Flights**	**% Using ADS-C**	**% Filing ADS-C**	**% Using CPDLC**	**% Filing CPDLC**	**Notes**
UAL	41180	97.66%	99.75%	97.64%	99.83%	
BAW	38750	83.70%	89.36%	83.50%	89.40%	*!
DAL	37951	94.77%	97.63%	95.28%	96.29%	
AAL	30950	89.65%	91.98%	89.94%	91.76%	
AFR	23003	94.89%	99.95%	94.46%	99.57%	*!
DLH	20191	92.83%	99.38%	93.92%	99.39%	*!
VIR	15629	99.74%	99.63%	99.73%	99.63%	
ACA	15419	93.98%	97.04%	94.64%	97.02%	
KLM	13537	99.40%	99.92%	99.51%	99.39%	
EIN	12162	52.52%	52.87%	52.52%	52.71%	
THY	8176	48.26%	48.97%	48.09%	50.12%	
SWR	7386	89.29%	96.62%	90.56%	96.64%	*!
RYR	7028	0.00%	0.34%	0.00%	0.00%	
ICE	6888	0.00%	0.00%	0.00%	0.00%	
TOM	6779	62.37%	67.31%	62.44%	64.27%	
TSC	6034	78.79%	86.26%	79.55%	86.33%	*!
TCX	5860	39.33%	41.06%	39.98%	41.25%	
RCH	5775	71.31%	89.85%	71.12%	90.03%	*!
BER	4851	59.47%	94.02%	60.03%	89.28%	*!
AZA	4596	96.30%	98.98%	97.13%	98.89%	
UAE	4415	88.81%	99.86%	88.65%	99.86%	*!
CFG	4400	76.32%	79.14%	76.59%	80.73%	
EZY	3892	0.00%	0.00%	0.00%	0.00%	
FDX	3542	94.49%	99.21%	91.11%	99.46%	!
EXS	3403	0.00%	0.00%	0.00%	0.00%	
QTR	3165	90.87%	99.94%	89.19%	99.72%	*!
UPS	3017	98.41%	99.73%	96.65%	99.73%	!
AUA	2985	85.09%	99.40%	85.13%	99.40%	*!
NAX	2937	54.44%	79.06%	54.44%	79.81%	*!
CLX	2875	87.48%	100.00%	87.79%	99.93%	*!
WOW	2574	0.00%	0.00%	0.00%	0.08%	
ROU	2476	27.95%	98.02%	28.59%	97.98%	*!
BEL	2440	38.73%	40.49%	38.93%	40.49%	
AWE	2308	74.65%	76.60%	75.04%	75.35%	
MON	2289	2.58%	0.09%	0.00%	3.58%	
SAS	2156	80.57%	82.05%	81.22%	81.86%	
SVA	2119	87.07%	99.06%	87.92%	99.15%	*!
FWI	2066	99.76%	99.90%	99.76%	99.81%	
ELY	1891	83.45%	81.17%	79.85%	84.51%	!
GEC	1879	68.81%	100.00%	67.96%	100.00%	*!
ETD	1863	79.01%	99.95%	78.74%	99.95%	*!
GTI	1830	92.62%	99.62%	93.99%	99.62%	*!
TFL	1777	83.46%	89.36%	83.46%	90.32%	*!
XLF	1714	67.50%	90.02%	67.50%	89.67%	*!
IBE	1579	59.34%	83.41%	56.55%	90.82%	*!
JAI	1401	96.79%	100.00%	99.43%	100.00%	
BOS	1373	0.00%	0.00%	0.00%	0.00%	

United Kingdom Reporting on ADS-C/CPDLC Equipage and Usage by Operator

Aggregate Period: **Jan 01, 2015 to Dec 31, 2015 (12 months)**

Operator (3-ltr ICAO Code)	Total Flights	% Using ADS-C	% Filing ADS-C	% Using CPDLC	% Filing CPDLC	Notes
FPO	1302	0.00%	0.00%	0.00%	0.00%	
EDW	1284	48.83%	80.45%	50.08%	80.45%	*!
ETH	1245	87.15%	76.55%	84.42%	75.98%	$£
AMX	1208	68.05%	98.68%	0.00%	100.00%	!
CKS	1206	80.18%	84.91%	71.48%	84.91%	!
CRL	1182	99.26%	98.48%	99.42%	98.14%	
MPH	1179	25.02%	25.28%	24.94%	25.36%	
AFL	1157	52.72%	98.53%	0.00%	98.53%	*!
JTG	1128	0.00%	0.00%	0.00%	0.00%	
TAM	1127	70.19%	99.91%	63.09%	99.82%	*!
RJA	1089	64.46%	87.97%	74.56%	96.88%	*!
DHK	1068	94.57%	72.28%	88.58%	99.91%	$!
LOT	1051	83.44%	93.91%	82.87%	93.91%	*!
TAY	1020	79.61%	84.71%	81.08%	84.71%	*

Notes

*	ADS-C usage is over 5% lower than filed ADS-C equipage
!	CPDLC usage is over 5% lower than filed CPDLC equipage
$	ADS-C usage is over 5% higher than filed ADS-C equipage
£	CPDLC usage is over 5% higher than filed CPDLC equipage

Iceland Reporting on ADS-C/CPDLC Equipage and Usage by Operator Period: 2015-01-01 to 2016-01-01															
Operator (3-ltr ICAO Code)	Total Flights	% Using ADS-C	% Filing ADS-C	% Using CPDLC	% Filing CPDLC	% Filing RNP4	% Using ADS-B	% Filing ADS-B	% Using, Not Filing ADS-C	% Using, Not Filing CPDLC	% Using, Not Filing ADS-B	% Filing, Not using ADS-C	% Filing, Not using CPDLC	% Filing, Not using ADS-B
ICE	21134	0.00%	0.00%	0.00%	0.00%	0.00%	98.52%	92.70%	0.00%	0.00%	7.06%	0.00%	0.00%	1.24%
UAL	8854	86.75%	89.43%	86.49%	89.63%	77.61%	84.04%	72.98%	0.37%	0.24%	24.81%	3.05%	3.38%	13.76%
DAL	7203	83.53%	94.70%	83.48%	95.09%	93.35%	87.27%	75.23%	0.74%	0.42%	14.83%	11.90%	12.02%	2.79%
UAE	7043	88.49%	99.62%	83.23%	99.62%	99.60%	58.23%	99.65%	0.06%	0.06%	0.30%	11.19%	16.44%	41.72%
DLH	6421	87.20%	88.34%	87.07%	88.34%	88.35%	95.55%	88.30%	0.06%	0.06%	11.01%	1.20%	1.32%	3.77%
BAW	5735	68.18%	68.04%	68.07%	68.11%	12.21%	97.49%	86.64%	1.97%	1.90%	12.24%	1.83%	1.94%	1.39%
SAS	5360	79.66%	79.53%	79.65%	80.28%	80.30%	95.60%	94.44%	0.69%	0.02%	5.28%	0.56%	0.65%	4.12%
ACA	4700	87.66%	88.89%	86.96%	88.87%	11.28%	91.98%	88.89%	0.23%	0.26%	10.40%	1.47%	2.17%	7.32%
WOW	4605	0.00%	0.00%	0.00%	1.69%	0.00%	96.46%	76.92%	0.00%	0.00%	22.61%	0.00%	1.69%	3.06%
Nzzz	4235	21.58%	20.87%	20.94%	22.48%	30.77%	43.75%	25.57%	4.13%	1.98%	22.08%	3.42%	3.52%	3.90%
ETD	3679	92.47%	99.81%	89.24%	99.81%	99.65%	61.59%	99.81%	0.05%	0.05%	0.16%	7.39%	10.63%	38.38%
THY	3330	97.06%	93.33%	96.97%	96.76%	98.68%	92.46%	96.67%	5.50%	1.92%	3.09%	1.77%	1.71%	7.30%
NAX	3196	83.79%	84.01%	83.79%	84.11%	95.81%	96.71%	84.67%	0.44%	0.06%	15.14%	0.66%	0.38%	3.10%
KLM	3097	87.21%	88.83%	87.15%	88.83%	88.83%	98.32%	88.83%	0.29%	0.29%	10.62%	1.91%	1.97%	1.13%
QTR	2976	98.05%	98.82%	98.12%	98.82%	98.79%	93.38%	98.82%	0.00%	0.00%	0.71%	0.77%	0.71%	6.15%
FLI	2961	0.00%	0.00%	0.00%	0.00%	0.00%	98.89%	0.00%	0.00%	0.00%	98.89%	0.00%	0.00%	0.00%
AFL	2936	98.30%	99.01%	98.09%	99.90%	99.01%	69.55%	99.90%	0.03%	0.03%	0.10%	0.75%	1.84%	30.45%
AAL	2360	68.56%	79.87%	68.43%	79.66%	71.86%	95.25%	7.84%	2.20%	2.20%	87.50%	13.52%	13.43%	0.08%
EZY	2068	0.00%	0.00%	0.00%	0.00%	0.00%	99.18%	0.00%	0.00%	0.00%	99.18%	0.00%	0.00%	0.00%
LOT	1855	98.92%	98.81%	98.92%	98.81%	8.95%	99.08%	0.65%	0.38%	0.38%	98.49%	0.27%	0.27%	0.05%
AFR	1842	79.10%	80.18%	78.66%	80.24%	77.85%	97.39%	80.18%	0.49%	0.43%	18.68%	1.57%	2.01%	1.47%
AIC	1791	96.98%	99.66%	96.98%	99.94%	0.00%	54.89%	99.66%	0.28%	0.00%	0.28%	2.96%	2.96%	45.06%
BER	1690	54.38%	55.38%	54.38%	55.38%	77.99%	93.20%	80.53%	0.00%	0.00%	18.76%	1.01%	1.01%	6.09%
VIR	1685	93.77%	94.54%	93.29%	94.54%	12.94%	97.51%	66.41%	0.30%	0.30%	32.64%	1.07%	1.54%	1.54%
CPA	1498	99.33%	99.47%	99.00%	99.47%	100.00%	21.09%	99.47%	0.47%	0.47%	0.27%	0.60%	0.93%	78.64%
ELY	1172	81.14%	79.86%	81.14%	82.42%	19.80%	93.77%	82.34%	2.65%	0.17%	17.15%	1.37%	1.45%	5.72%
FIN	1099	95.09%	98.09%	95.09%	95.45%	70.97%	98.09%	93.36%	0.09%	0.09%	6.55%	3.09%	0.45%	1.82%
TSO	1043	72.87%	74.30%	72.96%	79.19%	79.67%	61.74%	3.07%	0.48%	0.48%	59.06%	1.92%	6.71%	0.38%
FXI	1037	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWR	1008	93.35%	94.54%	93.35%	94.54%	94.54%	96.63%	94.64%	0.00%	0.00%	5.06%	1.19%	1.19%	3.08%

APPENDIX G — AVIONICS FIXES TO THE DATA LINK PERFORMANCE PROBLEMS

(*paragraph 3.2.7 refers*)

PR	System	Description	Status	Notes
1021-MM	737, 747, 757, 767, MD-11	Rockwell Collins CMU-900 “peripheral lockup” issue	CLOSED	CLOSED with availability of Rockwell Collins CMU-900 core software part number 832-9548-012
1145-SN	777	777 unable to send messages after CPDLC transfer	OPEN	To be CLOSED with availability of 777 AIMS-2 BPV17A software
1229-SN	A330/A340	A330/A340 ADS-C predicted route group issues	CLOSED	CLOSED with availability of A330/A340 next FANS A+ standard
1358-MM	777	777 "ack-n-toss" issue (ACARS avionics acknowledge receipt of FANS uplinks but do not deliver them to the FANS avionics)	CLOSED	CLOSED with availability of 777 AIMS-2 BPV17.1 software
1405-GS	787	787 loses SATCOM link after losing VHF Cat B link	CLOSED	CLOSED with availability of 787 CMF BP2.5 software
1480-SN	MD-11	MD-11 sends unexpected ADS-C lateral deviation report	CLOSED	CLOSED with availability of MD-11 FMC -922 software
1534-GS	787	787 does not respond to AFN uplink messages	CLOSED	CLOSED with availability of 787 CMF BP2.5 software
1540-SN	A380	A380 avionics reset when aircraft is climbing and flight crew sends a position report with the CLIMBING TO element	CLOSED	CLOSED with availability of A380 FANS A+B Batch 5 software
1556-GS	787	787 sends CPDLC disconnect request or no response to CPDLC connect requests	CLOSED	CLOSED with availability of 787 CMF BP3 software
1585-GS	787	787 does not respond to ADS-C uplink messages	CLOSED	CLOSED with availability of 787 CMF BP2.5 software
1644-SN	A380	A380 sends duplicate responses to uplink messages received via different media	CLOSED	CLOSED with availability of A380 FANS A+B Batch 5 software
1726-RP	747-8	747-8 Inmarsat Classic Aero SATCOM avionics issues	CLOSED	CLOSED with availability of Rockwell Collins SDU-2200 part number 822-2556-103
1760-GS	787	787 SATCOM avionics issues	CLOSED	CLOSED with availability of 787 CMF BP3 software
1762-GS	787	787 message delays due to avionics message queuing issues	CLOSED	CLOSED with availability of 787 CMF BP2.5 software
1798-GS	787	787 fails to send armed MAINTAINING [altitude] reports	CLOSED	CLOSED with availability of 787 CMF BP3 software
1854-SN	A330/A340	A330/A340 responds to STANDBY with ERROR UnrecognizedMsgReference Number if STANDBY includes embedded ACARS acknowledgement to request	CLOSED	CLOSED with availability of A330/A340 CSB/CLR7.3 software
1881-SN	A330/A340	A330/A340 sends ADS-C reports with zero time-to-go	CLOSED	CLOSED with availability of A330/A340 FMS300 REL1A software
1885-SN	A330/A340	A330/A340 sends duplicate responses to uplink messages received via different media	CLOSED	CLOSED with availability of A330/A340 CSB/CLR7.3 software

PR	System	Description	Status	Notes
1913-SN	A380	A380 does not allow CPDLC downlink responses to CPDLC uplink messages	CLOSED	CLOSED with availability of A380 FANS A+B (Batch 5) software
1923-RP	747-8	747-8 (or 747-400 with 747-8 FMC) responds to CPDLC connect request with CPDLC disconnect request	CLOSED	CLOSED with availability of 747-8 FMC BP3.1 software
1943-RP	747-8	747-8 (or 747-400 with 747-8 FMC) AFN protocol errors	CLOSED	CLOSED with availability of 747-8 FMC BP3.1 software
1953-MM	A330/A340	A330/A340 sends duplicate waypoints in route request	CLOSED	CLOSED with availability of A330/A340 P4 (Step1A) software
2102-MM	A330/A340	A330/A340 sends invalid value in ADS-C predicted route group	OPEN	To be CLOSED with availability of A330/A340 CSB/CLR7.4 software

APPENDIX H — PROPOSED AMENDMENTS TO NAT SPG CONCLUSION 49/11, APPENDIX J (NAT SPG/49 REPORT REFERS)

(*paragraph 3.2.12 refers*)

NAT SPG Conclusion 49/11 – NAT Region Data Link Mandate (DLM) Phase 2

That, with the main objective of mitigating safety risk in the NAT Region:

a) the Phase 2 of the implementation of the NAT Region Data Link Mandate, as contained in **Appendix J** be approved;

b) the United States coordinate the development of a draft document to support NAT Provider States to publish harmonised AIP provisions announcing Phase 2 implementation steps (2A, 2B and 2C) and associated policies and present a draft to the next NAT ATMG;

c) NAT IMG/43 be mandated to review and approve the draft document mentioned in b) above;

d) the Secretariat develop a NAT OPS bulletin based on the document approved as per c) above; and

e) the NAT SPG review the NAT DLM Implementation Plan on an annual basis.

Appendix J – Recommendation for the implementation of Phase 2 of the NAT Region Data Link Mandate

(Paragraph 3.1.35 and Appendix J of NAT SPG/49 report refers)

2018 and 2020 Goals

The 2018 date is associated with the timing for ASBU Block 0, which ends in 2018 and in particular, Module B0-40 (2013-2018), which includes safety and efficiency improvements enroute supported by data link.

The goals are that: by 2018, 90% of aircraft operating in the NAT Region airspace at FL290 and above will be equipped with FANS 1/A or equivalent ADS-C and CPDLC and that by 2020, 95% of aircraft operating in that airspace will be so equipped.

Phase 2 Implementation

- Phase 2A, commencing 5 February 2015: FL350 to FL390 within the NAT OTS;
- Phase 2B, commencing 7 December 2017: FL350-FL390 throughout the ICAO NAT Region;
- Phase 2C, commencing 30 January 2020: FL290 and above throughout the ICAO NAT Region.

Airspace Not Included in the NAT Region Data Link Mandate Airspace

- Areas where ATS surveillance (radar and/or ADS-B) and VHF voice communications services are provided airspace as depicted in State AIPs (provided the aircraft is suitably equipped)
- Airspace north of 80° North[2]
- New York Oceanic FIR[3]

[2] Airspace north of 80°N lies outside the reliable service area of geostationary satellites.
[3] Until revisions are made to the U.S. Code of Federal Regulations for regulations related to NAT operations.

Flight Planning

The following flights are permitted to flight plan to enter the airspace associated with the NAT Region Data Link Mandate:

1. Flights equipped with and prepared to operate the required FANS 1/A or equivalent equipment (NAT SUPPs 3.3.2 for CPDLC and 5.4.2 for ADS-C); and

2. Non-equipped flights which file STS/FFR, HOSP, HUM, MEDEVAC SAR, or STATE in Item 18 of the flight plan. However, depending on the tactical situation at the time of flight, such flights may not receive an ATC clearance which fully corresponds to the requested flight profile.

Operations

- Any non-DLM flight may request to climb or descend through the NAT DLM airspace. Such requests will be considered on a tactical basis.
- ALTRV requests will be considered on a case by case basis (as is done today regarding NAT MNPSairspace), irrespective of the equipage status of the participating aircraft.
- If a flight experiences an equipment failure AFTER departure which renders the aircraft non-DLM compliant, requests to operate in the NAT Region Data Link Airspace will be considered on a tactical basis. Such flights must indicate their non-DLM status prior to entering the airspace. If the failure occurs while the flight is in NAT Region Data Link Mandate Airspace, ATC must be immediately advised. Such flights may be re-cleared so as to avoid the airspace, but consideration will be given to allowing the flight to remain in the airspace, based on tactical considerations.
- If a flight experiences an equipment failure PRIOR to departure which renders the aircraft non-DLM compliant, the flight should not flight plan to enter the NAT Regional DLM Airspace.
- NAT DLM airspace restrictions are not applicable to aircraft experiencing a contingency situation.

EUR/NAT Interface

Where the NAT interfaces with the EUR Data Link Implementation Rule airspace, agreement will be established between the NAT and EUR ANSPs that will facilitate the vertical transition of traffic to and from the NAT Region Data Link Mandate and the EUR Data Link Implementation Rule areas. The transition will be conducted as soon as is practicable by the initial EUR Domestic area along the common FIR/UIR boundary bordering the NAT Region Data Link Mandate and the operator shall ensure the transition is complete prior to crossing any subsequent FIR/UIR boundary.

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APPENDIX I — PROPOSED AMENDMENTS TO THE GUIDANCE FOR STATE AIP ON NAT DLM IMPLEMENTATION

(*paragraph 3.2.12 refers*)

NOTICE OF PLANNED EXPANSION OF MANDATE FOR DATA LINK SERVICES IN THE NORTH ATLANTIC REGION

Introduction

The first phase of the mandate for data link services in the North Atlantic (NAT) region commenced 7 February 2013. As of that date, all aircraft operating on or at any point along two specified tracks within the NAT organized track system (OTS) between flight level (FL) 360 to FL 390 (inclusive) during the OTS validity period are required to be fitted with, and using, controller-pilot data link communications (CPDLC) and Automated Dependent Surveillance–Contract (ADS-C) equipment (see North Atlantic Operations Bulletin 2012-031).

As notified in State letter EUR/NAT 12-0003.TEC (dated 04 January 2012), Phase 2 of the mandate will begin on 5 February 2015.

Purpose of Circular

This Aeronautical Information Circular (AIC) outlines the plan for Phase 2 of the NAT Data Link Mandate (DLM). As detailed below, Phase 2 is planned to be implemented in three steps (2A, 2B and 2C), commencing on 5 February 2015, 7 December 2017 and 30 January 2020, respectively. This AIC also provides information on the expanded vertical and horizontal boundaries of NAT DLM airspace, policy for flight planning into NAT DLM airspace and NAT DLM operating policies.

Background

As concluded at the forty-ninth meeting of the North Atlantic Systems Planning Group (NAT SPG), the objectives of the NAT DLM are to enhance communication, surveillance and air traffic control (ATC) intervention capabilities in the NAT region, in order to reduce collision risk and enable the NAT target level of safety to be met, particularly in the vertical plane. ADS-C provides capabilities for conformance monitoring of aircraft adherence to cleared route and FL, thereby significantly enhancing safety in the NAT region. ADS-C also facilitates search and rescue operations and the capability to locate the site of an accident in oceanic airspace. CPDLC significantly enhances air/ground communication capability and therefore controller intervention capability.

The NAT SPG goals for the expansion of the NAT DLM to increase the level of aircraft data link system equipage, are in concert with the International Civil Aviation Organization (ICAO) Global Air Navigation Plan (GANP) (Doc 9750) Aviation System Block Upgrade (ASBU) Block 0, Module B0-40 (2013-2018). This module calls for safety and efficiency improvements for enroute operations supported by data link. The NAT SPG objectives are that by 2018, 90% of aircraft operating in the NAT region airspace at FL 290 and above will be equipped with Future Air Navigation Systems 1/A (FANS 1/A) (or equivalent) ADS-C and CPDLC systems and that by 2020, 95% of aircraft operating in that airspace, will be so equipped.

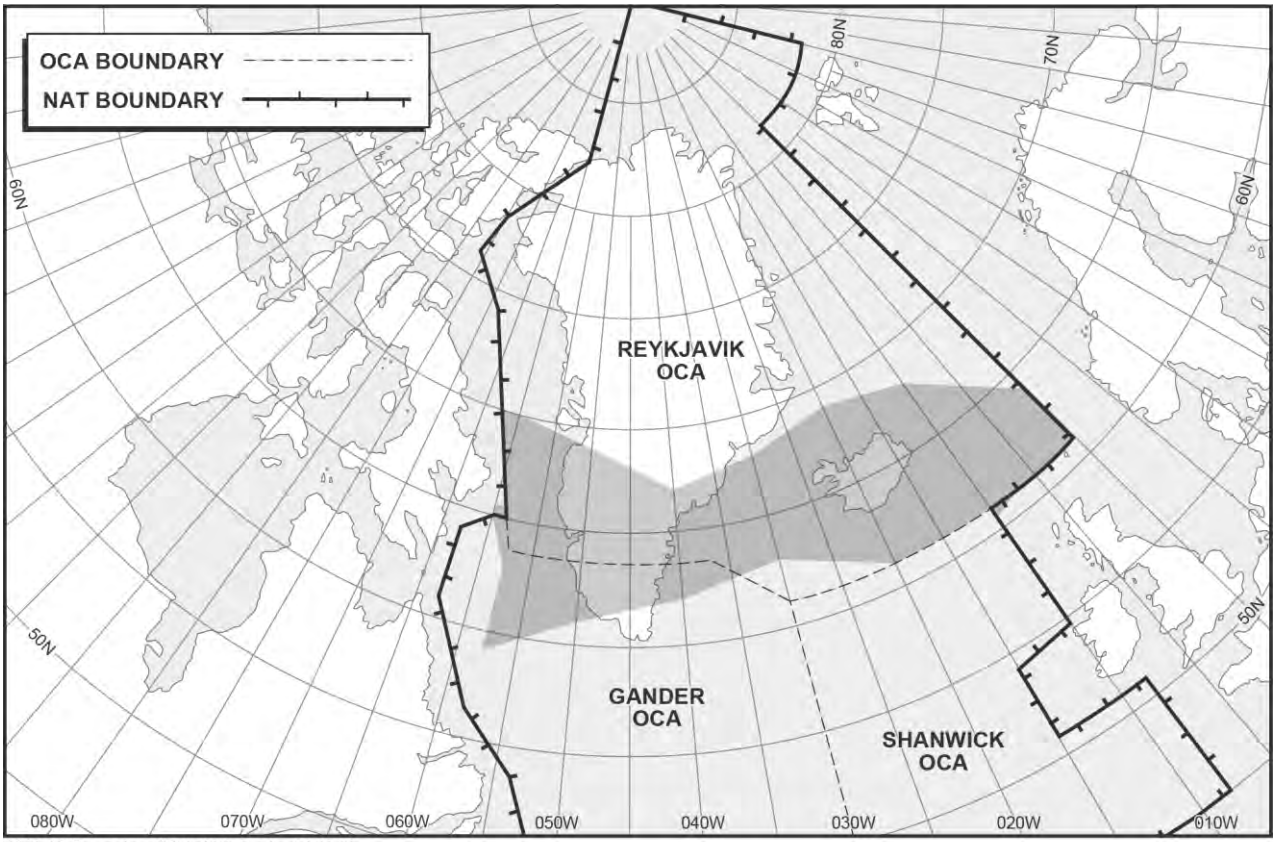
Planned Vertical and Horizontal Boundaries for NAT Region DLM Airspace

- Phase 2A, commencing 5 February 2015: FL 350 to FL 390 (inclusive) all tracks within the NAT OTS. This phase applies to all aircraft operating on or at any point along the tracks;
- Phase 2B, commencing 7 December 2017: FL 350 to FL 390 (inclusive) throughout the ICAO NAT region;
- Phase 2C, commencing 30 January 2020: FL 290 and above throughout the ICAO NAT region.

Airspace Not Included in NAT Region DLM Airspace

- Airspace north of 80° North (N). (Airspace north of 80°N lies outside the reliable service area of geostationary satellites);
- New York Oceanic flight information region (FIR);
- Air traffic services (ATS) surveillance airspace (i.e. airspace where surveillance is provided by radar and/or automatic dependent surveillance-broadcast [ADS-B]), as depicted in State Aeronautical Information Publications (AIP), provided:
  - the aircraft is suitably equipped (transponder/ADS-B extended squitter transmitter); and
  - the entirety of the flight planned route is contained within ATS surveillance and VHF voice communications coverage.

For planning purposes, a depiction and description of the estimated extent of ATS surveillance airspace considered to be exempt from the DLM in the NAT region on from 5 February 2015 is depicted in the chart provided below.



2014_97 Expansion of Data Link Service 21.11.14

Northern boundary:
64N000W – 68N010W – 69N020W – 68N030W – 67N040W – 69N050W – 70N060W – ADSAM.

Southern boundary:
RATSU (61N000W) – 61N020W – 63N030W – 62N040W – 61N050W – SAVRY.

Secretariat Note – The map above to be amended

Flights Allowed to Flight Plan into NAT Region DLM Airspace

The following flights will be permitted to flight plan to enter the NAT DLM airspace:

1. Flights equipped with and prepared to operate FANS 1/A (or equivalent) CPDLC and ADS-C data link systems. (NAT *Regional Supplementary Procedures* (ICAO Doc 7030) paragraphs 3.3.2 and 5.4.2 apply for CPDLC and ADS-C respectively); and

2. Non-equipped flights that file STS/FFR, HOSP, HUM, MEDEVAC SAR, or STATE in Item 18 of the flight plan. (Depending on the tactical situation at the time of flight, however, such flights may not receive an ATC clearance which fully corresponds to the requested flight profile).

Operational Policies Applicable To NAT Region DLM Airspace

Any aircraft not equipped with FANS 1/A (or equivalent) systems may request to climb or descend through the NAT DLM airspace.

- Altitude reservation (ALTRV) requests will be considered on a case by case basis (as is done today regarding NAT minimum navigation performance specifications [MNPS] airspace), irrespective of the equipage status of the participating aircraft.

- If a flight experiences an equipment failure **AFTER DEPARTURE** which renders the aircraft unable to operate FANS 1/A (or equivalent) CPDLC and/or ADS-C systems, requests to operate in the NAT DLM airspace will be considered on a tactical basis. Such flights must notify ATC of their status **PRIOR TO ENTERING** the airspace.

- If a FANS 1/A data link equipment failure occurs while the flight is **OPERATING WITHIN NAT DLM AIRSPACE**, ATC must be immediately advised. Such flights may be re-cleared so as to avoid the airspace, but consideration will be given to allowing the flight to remain in the airspace, based on tactical considerations.

- If a flight experiences an equipment failure **PRIOR** to departure which renders the aircraft non-DLM compliant, the flight should re-submit a flight plan so as to remain clear of the NAT regional DLM airspace.

European/North Atlantic (EUR/NAT) Interface Flight Planning

Where the NAT interfaces with the EUR data link implementation rule airspace, procedures will be established by the air navigation service providers (ANSP) concerned to facilitate the vertical transition of traffic to and from the NAT region DLM and the EUR data link implementation rule areas. The transition will be conducted as soon as is practicable by the initial EUR domestic area along the common FIR / upper flight information region (UIR) boundary bordering the NAT region DLM. The operator and the ANSP shall ensure that the vertical transition is complete prior to crossing any subsequent FIR/UIR boundary.

Further Information

For further Information, please

contact: NAV CANADA
Gander Area Control Centre
P.O. Box 328
Gander, NL A1V 1W7
Attn: Jeffrey Edison
Manager, ACC Operations

Direct line: 709-651-5223
E-mail: edisonj@navcanada.ca

James Ferrier
Manager, Aeronautical Information Management

APPENDIX J — PROJECT DEFINITION OF THE SOUTHEAST CORNER ROUTES PROJECT TEAM

(*paragraph 3.2.19 refers*)

Project Title	NAT South East Corner Routes
Parent Group	SPG
Project Supervisory body	IMG
Project Period	May 2016 – December 2016 (IMG/49 with short period of follow up post IMG/49 meeting)
Project Objective	Within the context of the NAT DLM, NAT IMG/48 IP/09 and NAT IMG/48 WP/17 review the NAT South East Corner issues with all interested stakeholders such that a common description of the issues exists and identify potential solutions as appropriate. Construct as necessary draft IMG decision and draft SPG conclusion for any proposed recommend solution for IMG/49. Any recommended solution must identify not only the South East corner airspace implications but also any subsequent impact/opportunities for the adjacent or wider NAT airspace/routes.
Project Outcomes:	1. NAT South East Corner Common Description of issues, including their scale and impact, for SPG/52 2. Potential solutions to resolve the issues identified in 1) 3. Presentation/Working Paper to IMG/49 that provides a review of potential solutions with, if consensus can be reached, recommendation on preferred solution. 4. Support to IMG to create the required input on any recommended solution to the SPG and its contributory bodies as necessary.
Membership	All interested stakeholders of the NAT South East Corner to include, but not restricted to, Airspace Users and ANSPs.
Coordination Requirements	SOG, IMG and EFFG and their contributory bodies as appropriate and Eurocontrol Network Manager
Project High level Tasks	1. Coordinate across all NAT South East Corner interested stakeholders and establish Project team. 2. Develop the NAT South East Corner Common Description of issues and draft IP/WP, coordinated with the IMG members, for SPG/52 3. Identify all potential solutions that could resolve those issues identified in 2) to the satisfaction of all stakeholders 4. Report the summary of solution considerations and, if consensus can be reached, a recommended solution to IMG/49.
Project Lead	NATS – Alastair Muir
Project Secretariat Support	TBD

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APPENDIX K — NAT 2015 ANNUAL SAFETY REPORT (ASR)

(*paragraph 5.2.1 refers*)

APPENDIX ISSUED SEPARATELY

(Attached to this file)

APPENDIX L — DRAFT NAT EANP VOLUME III

(*paragraphs 6.1.6, 6.1.11, 6.1.14 and 6.1.17refer*)

APPENDIX ISSUED SEPARATELY

(Attached to this file)

APPENDIX M — AMENDMENT TO NAT DOC 007 ON FREE ROUTE DESCRIPTIONS

(*paragraph 6.2.7 refers*)

1.1 General

1.1.1 With effect from 04 February 2016 the airspace previously designated as NAT MNPSA, but excluding the SOTA and BOTA areas, is re-designated as NAT HLA. This NAT HLA will also additionally include the airspace of the BODO OCEANIC FIR (FL285 to FL420, inclusive). State Approvals for NAT MNPSA operations granted prior to that date will be valid for NAT HLA operations. Except that those Approvals issued prior to 01 January 2015 and based upon the earlier "6.3 NMs" MNPS standard will not be valid beyond January 2020. Any NAT MNPS Approvals granted using PBN specifications for navigation equipment performance will continue to be valid.

1.1.2 It is implicit in the concept of the NAT HLA that all flights within the airspace achieve the highest standards of horizontal and vertical navigation performance and accuracy. Formal monitoring programmes are undertaken to quantify the achieved performances and to compare them with standards required to ensure that established Target Levels of Safety (TLS) are met.

Note: Collision Risk Modelling is used to estimate risk in each of the three dimensions (i.e. lateral, longitudinal and vertical). Target maxima set for these estimates are expressed in terms of potential collisions per flight hour and are known as "Target Levels of Safety (TLSs)".

1.1.3 Aircraft operating within NAT HLA airspace are required to meet specified navigation performance in the horizontal plane through the carriage and proper use of navigation equipment that meets identified standards and has been approved as such by the State of Registry or State of the Operator for the purpose. Such approvals encompass all aspects affecting the expected navigation performance of the aircraft, including the designation of appropriate cockpit/flight deck operating procedures.

1.1.4 Within the NAT HLA airspace, flights are operated either on organised track system (OTS), on fixed routes or random routes and routings. In all configurations, airspace users may freely plan a User Preferred Trajectory (UPR) between a defined entry point and a defined exit point, with the defined segment length and segment anchoring waypoints as published by appropriate ATS authority and subject to airspace availability (the provisions detailed in the NAT SUPPs (Doc 7030) paragraphs 2.1.9.2 and 2.1.9.3 to be observed). Within this airspace, flights remain subject to air traffic control.

Note: The NAT HLA airspace is de-facto a Free Route Operations Airspace with some constraints necessitated by the need to ensure safety of operations in the NAT Region.

1.1.5 In the areas where surveillance (SSR and/or ADS-B) and VHF voice coverage are available, airspace users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) waypoints, without reference to the ATS route network, or the provisions detailed in the NAT SUPPs (Doc 7030) paragraphs 2.1.9.2 and 2.1.9.3, subject to airspace availability.

~~1.1.4~~ 1.1.6 Since January 2002 when the final phase implementation of RVSM at all levels in NAT MNPS Airspace took place, all aircraft intending to operate within NAT MNPS/HLA Airspace have had to be equipped with altimetry and height-keeping systems which meet RVSM Minimum Aircraft System Performance Specifications (MASPS). RVSM MASPS are contained in *ICAO Doc 9574* and detailed in designated FAA document, *AC91-85*, and in Joint Aviation Authority (JAA) Temporary Guidance Leaflet (TGL No.6), Revision 1. These documents can be downloaded from:

APPENDIX N — UPDATES TO THE NORTH ATLANTIC SYSTEMS PLANNING GROUP HANDBOOK (NAT DOC 001)

(*paragraph 6.4.1 refers*)

APPENDIX ISSUED SEPARATELY

(Attached to this file)

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APPENDIX O — EUR/NAT VOLCANIC ASH CONTINGENCY PLAN (VACP) EDITION 2.0.0

(*paragraph 6.5.11 refers*)

APPENDIX ISSUED SEPARATELY

(Attached to this file)

APPENDIX P — PFA TO NAT DOC 006, PART I, ON UPDATES TO REYKJAVIK CONTINGENCY ROUTES AND CONTACTS

(*paragraph 6.5.14 refers*)

Editorial Note: Amendments are arranged to show deleted text as boxed greyed out text using strikeout (~~text to be deleted~~), and added text with grey shading (text to be inserted).

[1] modify Chapter 3 – Detailed Procedures – Reykjavik OACC, Section 3.7 – Reykjavik OACC – Contingency Route Structure*, as follows:*

…

Night Tracks

NIGHT TRACKS will be effective on entry into Reykjavik FIR/CTA from 2300 to 0600 except ICECON 11 and 13 which will become effective from 0100 until 0600 at 30W.

ICECON 7 ADSAM - 70N060W - 70N050W - 69N040W - 67N030W - 65N020W - 63N010W - GONUT
Eastbound FL340/350
Westbound FL330

ICECON 9 DARUB - 67N050W - 66N040W - 65N030W - 64N020W - 62N010W – MATIK - BESGA
Eastbound FL340/350
Westbound FL330

ICECON 11 62N040W - 63N030W - ~~KEF~~ KFV - 64N020W - 63N010W -IPTON
Eastbound FL360/370/380
Westbound NIL

…

Tracks available 24 hours

Iceland - inbound and outbound

INBOUND

RATSU - ALDAN - ~~KEF~~ KFV
Westbound FL320

GUNPA - 63N010W - ING - ~~KEF~~ KFV
Westbound FL 310

61N040W - 62N030W – ~~DROMI~~ ELREX – ELDIS – KFV
Eastbound FL 290/310

BIAR – IPTON 64N010W ES AKI
BIEG – IPTON 64n010W ES
Westbound FL300

OUTBOUND

~~KEF~~ KFV - BREKI - RATSU- BARKU
Eastbound FL 310 - To be level by BREKI

Radial 098 until FL 320 - 63N010W - GUNPA

~~KEF~~ KFV - ~~EMBLA~~ RALOV – RAKIS - 63N030W – 62N040W
Westbound FL 320

BIAR – AKI ES 64N010W IPTON
BIEG – ES 64N010W IPTON
Eastbound FL290

…

[2] *modify* Chapter 3 – Detailed Procedures – Reykjavik OACC, Appendix B – Contact Details - Reykjavik OACC*, as follows:*

Reykjavik OACC		
Reykjavik Shift Manager (07:00-23:00)	+354 424 4343	acc@isavia.is
Reykjavik Shift Manager Inmarsat Satellite Phone (07:00-23:00)	+870 776 626 628	
Reykjavik Shift Manager Iridium Satellite Phone (07:00-23:00)	+881 631 450 347	
Supervisor (23:00-07:00)	+354 424 4141	
Reykjavik OACC Telefax	+354 424 4200	
North Sector primary commercial/ 1st backup	+354 424 4264	
West Sector primary commercial/ 1st backup	+354 424 4264	
East Sector primary commercial/ 1st backup	+354 424 4263	
South Sector primary commercial/ 1st backup	+354 424 4262	
South Sector domestic operations commercial/ 1st backup	+354 424 4261	
All Sectors 2nd backup	+354 568 3033	
All Sectors 3rd backup	+354 568 3035	
JRCC Iceland	+354 545 2100	
System Operators and Flight Data Specialists	+354 424 4265	
System Operators and Flight Data Specialists, Iridium Satellite Phone	+881 621 434 042	
Systems Department	+354 424 4328	
Systems Department, Mobile	+354 897 8483	
Manager Reykjavik OACC Ms. Þórdís Sigurðardóttir	+354 424 45140 +354 699 8504 (mobile)	thordis.sigurdardottir@isavia.is
Deputy Manager Reykjavik OACC Mr. Árni Baldursson	+354 424 ~~4183~~ 5141 +354 615 2565 (mobile)	arni.baldursson@isavia.is
~~Manager Airspace and Procedures~~ Senior ATM expert Mr. Sigurleifur Kristjánsson	+354 424 ~~4123~~ 5106 +354 897 0336 (mobile)	sigurleifur.kristjansson@isavia.is
Iceland Radio	+354 563 6502	supervisor.iceland.radio@isavia.is

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APPENDIX Q — AMENDMENT TO NAT DOC 007, SUBSEQUENT TO NEW WAYPOINTS IN "BLUE SPRUCE" ROUTES DESCRIPTIONS

(*paragraph 6.6.1 refers*)

*Editorial Note: Text proposed to be deleted is shown as boxed text using strikeout (~~text to be deleted~~), and text proposed to be added is with grey shading (*text to be inserted).

Modify NAT Doc 007, Chapter 12 – Separation, paragraph 12.2.2 *.as follows*:

…

One System Fails Before Take-Off

12.2.2 The pilot must consider:

a) delaying departure until repair is possible;

b) obtaining a clearance above or below NAT HLA airspace;

c) planning on the special routes known as the 'Blue Spruce' Routes, which have been established for use by aircraft suffering partial loss of navigation capability *(Note: As indicated in* Chapter 1*, these routes may also be flown by aircraft approved for NAT HLA operations but equipped with only a single LRNS)*. These Blue Spruce Routes are as follows:

- MOXAL – RATSU (for flights departing Reykjavik Airport)
  (VHF coverage exists. Non HF equipped aircraft can use this route)
- OSKUM – RATSU (for flights departing Keflavik Airport)
  (VHF coverage exists. Non HF equipped aircraft can use this route)
- RATSU – ALDAN – ~~KEF~~ KFV (Keflavik)
  (VHF coverage exists. Non HF equipped aircraft can use this route)
- ATSIX – 61°N 12°34'W – ALDAN – ~~KEF~~ KFV
  (HF is required on this route)
- GOMUP – 60°N 15°W – 61°N 16°30'W – BREKI – ~~KEF~~ KFV
  (HF is required on this route)
- ~~KEF~~ KFV – ~~EMBLA~~ EPENI – 63°N 30°W – 61°N 40°W – OZN
- ~~KEF~~ KFV – ~~GIMLI~~ SOPEN – DA (Kulusuk) – SF (Kangerlussuaq) – YFB
- SF (Kangerlussuaq) – 67°N 60°W - YXP
- OZN – 59°N 50°W – ALTOD - PRAWN – YDP
- OZN – 59°N 50°W – CUDDY - PORGY – HO
- OZN – 58°N 50°W – HOIST - LOACH – YYR

d) The following special routes may also be flown without an LRNS (i.e. with only short-range navigation equipment such as VOR, DME, ADF), but it must be noted that State approval for operation within NAT HLA airspace via these routes is still necessary:

- VALDI - MY (Myggenes) - ING – ~~KEF~~ KFV (G3)
- GONUT - MY (Myggenes) (G11)

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APPENDIX R — NAT TRAFFIC FORECAST (1 OCTOBER 2016)

(*paragraph 7.3.11 refers*)

APPENDIX ISSUED SEPARATELY

(Attached to this file)

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LIST OF ACRONYMS

ACARS	Aircraft Communications Addressing and Reporting System
ACC	Area Control Centre
ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance – Broadcast
ADS-C	Automatic Dependent Surveillance – Contract
ADS-B ITP	Automatic Dependent Surveillance – Broadcast In Trail Procedure
ADS-C CDP	Automatic Dependent Surveillance – Contract Climb and Descend Procedure
ADS-C RITF	ICAO APAC/NAT Inter-regional ADS-C Reporting Interval Task Force
AFL	Aircraft Flight Level
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
ANC	Air Navigation Commission
ANRF	Air Navigation Reporting Form
ANSP	Air Navigation Service Provider
AO	Aircraft Operator
AOCCC	Aircraft Operator Crisis Coordination Cell
APAC	(ICAO) Asia and Pacific (Regions)
APANPIRG	Asia Pacific Air Navigation Planning and Implementation Regional Group
ASBU	Aviation System Block Upgrades
ASR	Annual Safety Report
ATC	Air Traffic Control
ATM	Air Traffic Management
ATN/VDL2	Aeronautical Telecommunication Network/VHF Digital Link Mode 2
ATS	Air Traffic Service
ATSP	Air Traffic Service Provider
ATSU	Air Traffic Services Unit
BCA	Business Case Assessment
CAA	Civil Aviation Authority
CAEP	Committee on Aviation Environmental Protection
CFL	Cleared Flight Level
CO_2	Carbon Dioxide
COG	*see* EANPG COG
CONOPS	Concept of Operations
CPDLC	Controller Pilot Data Link Communications
CSP	Communication Service Provider
DLM	(ICAO NAT Region) Data Link Mandate
Doc 10004	*Global Aviation Safety Plan* (GASP)
Doc 4444	*Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM)
Doc 7030	*Regional Supplementary Procedures* (SUPPs)
Doc 8168	*Procedures for Air Navigation Services - Aircraft Operations* (PANS-OPS)
Doc 8400	*Procedures for Air Navigation Services – ICAO Abbreviations and Codes* (PANS-ABC)

Doc 9634	*Regional Air Navigation Plan – North Atlantic* (NAT eANP)
Doc 9750	*Global Air Navigation Plan* (GANP)
EACCC	European Aviation Crisis Coordination Cell
EANPG	European Air Navigation Planning Group
EANPG COG	EANPG Programme Coordinating Group
EASA	European Aviation Safety Agency
EEE	Electronic Environment En-route Air Traffic Organiser (ERATO)
ERATO	En-route Air Traffic Organiser (ERATO)
EUR	(ICAO) European (Region)
EUR (EAST) VOLCEX/SG	Volcanic Ash Exercises Steering Group for the (far) Eastern part of the EUR Region
EUR/NAT	European and North Atlantic
EUR/NAT VOLCEX SG	European and North Atlantic Volcanic Ash Exercises Steering Group
EVITA	European Crisis Visualisation Interactive Tool for ATFCM
FANS	Future Air Navigation System
fapfh	Fatal Accidents Per Flight Hour
FIR	Flight Information Region
FL	Flight Level
GANP	*Global Air Navigation Plan* (Doc 9750)
GASP	*Global Aviation Safety Plan* (Doc 10004)
GES	Ground-Earth Station
GNE	Gross Navigation Error
HF	High Frequency
IATA	International Air Transport Association
IBAC	International Business Aviation Council
IFAIMA	International Federation of Aeronautical Information Management Association
IFALPA	International Federation of Air Line Pilots Association
IFATCA	International Federation of Air Traffic Controllers' Association
IGA	General Aviation Aircraft
kg	Kilogram
km	Kilometre
LCC	Low-Cost Carriers
LHD	Large Height Deviation
LoA	Letter of Agreement
MATMC	Main Air Traffic Management Centre Moscow
Mt	Megatonne
NAT	(ICAO) North Atlantic (Region)
NAT Bulletin	North Atlantic Bulletin
NAT OESB	NAT Oceanic Errors Safety Bulletin
NAT OPS Bulletin	NAT Operational Bulletin
NAT CMA	North Atlantic Central Monitoring Agency
NAT DEMA	North Atlantic Deviations and Errors Monitoring Application
NAT DLMA	North Atlantic Data Link Monitoring Agency
NAT DMO	North Atlantic Document Management Office
NAT Doc	
NAT Doc 001	*North Atlantic Systems Planning Group Handbook*
NAT Doc 005	*Future ATM Concept of Operations for the North Atlantic Region*

NAT Doc 006 Part I	*Air Traffic Management Operational Contingency Plan – North Atlantic Region*
NAT Doc 006 Part II (also EUR Doc 019)	*Volcanic Ash Contingency Plan – European and North Atlantic Regions*
NAT Doc 007	*North Atlantic Operations and Airspace Manual*
NAT Doc 009	*NAT Service Development Roadmap* (NAT SDR)
NAT EFFG	North Atlantic Economic, Financial and Forecast Group
NAT IMG	North Atlantic Implementation Management Group
NAT eANPV3 PT	NAT eANP Volume III Project Team
NAT FROI PT	NAT Free Route Operations Implementation Project Team
NAT IMG SCRPT	NAT IMG Southeast Corner Routes Project Team
NAT RLatSM Ph 2 TPT	NAT IMG RLatSM Phase 2 Transition Project Team
NAT SB ADS-B PT	NAT Space Based ADS-B Project Team
NAT MWG	North Atlantic Mathematicians' Working Group
NAT OTS	North Atlantic Organized Track System
NAT PBCS PT	North Atlantic Performance-Based Communication and Surveillance Project Team
NAT POG	North Atlantic Procedures and Operations Group
NAT SG	North Atlantic Scrutiny Group
NAT SOG	North Atlantic Safety Oversight Group
NAT SPG	North Atlantic Systems Planning Group
NAT TIG	North Atlantic Technology and Interoperability Group
NAT CONOPS	*North Atlantic Future Concept of Operations*
NAT eANP	*Regional Air Navigation Plan – North Atlantic* (Doc 9634)
NAT HLA	NAT High Level Airspace
NAT SDR	*NAT Service Development Roadmap* (NAT Doc 009)
NAT SPG Handbook	*North Atlantic Systems Planning Group Handbook* (NAT Doc 001)
NM	Nautical Mile (approximately 1852 m)
NM NOP	Network Manager Network Operations Portal
NOPAC	Northern Pacific
NOTAM	Notice To Airmen
OACC	Oceanic Area Control Centre
OCA	Oceanic Control Area
OCL	Obstacle Clearance Limit
OCM	Oceanic Clearance Message
OPDLWG	Operational Data Link Working Group
OTS	*see* NAT OTS *or* PACOTS
PAC	(ICAO) Pacific (Region)
PACOTS	Pacific Organized Track System
PANS	Procedures for Air Navigation Services
PANS-ABC	*Procedures for Air Navigation Services – ICAO Abbreviations and Codes* (Doc 8400)
PANS-ATM	*Procedures for Air Navigation Services – Air Traffic Management* (Doc 4444)
PANS-OPS	*Procedures for Air Navigation Services - Aircraft Operations* (Doc 8168)
PBCS	Performance-Based Communication and Surveillance
PfA	Proposal for Amendment
PIRG	Planning and Implementation Regional Group
PR	Problem Reports
RASI	Regional Aviation System Improvements
RCP	Required Communication Performance

RF	Radio Frequency
RLatSM	25 nautical miles (NM) Reduced Lateral Separation Minima
RLatSM Plan	Implementation Plan for the Trial Application of RLatSM in the NAT Region
RLatSM Task List	Task List Supporting the Trial Implementation of RLatSM in the NAT Region
RLongSM	5 minutes (min) Longitudinal Separation Minimum
RNP	Required Navigation Perfomance
RSP	Required Surveillance Performance
SAT	South Atlantic (Region)
SATCOM	Satellite Communication
SATVOICE	Satellite Voice Communications
SB ADS-B	Space-Based ADS-B
SFL	Selected Flight Level
SIB	Safety Information Bulletin
SIGMET	SIGnificant METeorological Information
SRA	Safety Risk Assessment
SSP	Satellite Service Provider
SUPPs	*Regional Supplementary Procedures* (Doc 7030)
TLS	Target Level of Safety
ToRs	Terms of Reference
UTC	Coordinated Universal Time
VA	Volcanic Ash
VAA	Volcanic Ash Advisories
VAAC	Volcanic Ash Advisory Centre
VAG	Volcanic Ash Graphics
VHF	Very High Frequency
VOLCEX SG	*see* EUR/NAT VOLCEX SG, *or* EUR (EAST) VOLCEX SG
WG/SRP	Working Group for Strategic Review and Planning (of the ANC)

— END —