NAT SPG/55

INTERNATIONAL CIVIL AVIATION ORGANIZATION

FINAL

SUMMARY OF DISCUSSIONS AND CONCLUSIONS OF

THE FIFTY-FIFTH MEETING OF

THE NORTH ATLANTIC SYSTEMS PLANNING GROUP

Paris, 24 to 27 June 2019

PREPARED BY THE EUROPEAN AND NORTH ATLANTIC OFFICE OF ICAO JUNE 2019

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INTRODUCTION

PLACE AND DURATION

0.1 The Fifty-Fifth Meeting of the North Atlantic Systems Planning Group (NAT SPG) was held in the European and North Atlantic (EUR/NAT) Office of ICAO from 24 to 27 June 2019.

OFFICERS AND SECRETARIAT

0.2 The Meeting was chaired by Mr Ásgeir Pálsson (Iceland). Ms Silvia Gehrer, ICAO Regional Director, Europe and North Atlantic, was the Secretary of the Meeting, assisted by ICAO staff as listed in **Appendix A**. Mr Steve Creamer, Director of the ICAO Air Navigation Bureau also attended the meeting on the first day.

ATTENDANCE

0.3 The Meeting was attended by 32 participants from 9 States and 5 international organisations. Apologies were received from the International Federation of Air Traffic Controllers' Association (IFATCA). Lists of participants and contacts are at **Appendix A**. The list of meeting documentation is provided at **Appendix B**.

AGENDA

0.4 The NAT SPG agreed to the following agenda:

Agenda Item 1: Review of significant international aviation developments

Agenda Item 2: NAT planning and implementation programmes

Agenda Item 3: NAT safety performance and oversight issues

Agenda Item 4: NAT economic, financial and forecast issues

Agenda Item 5: NAT Documentation updates

Agenda Item 6: Work programme, including sub-groups

Agenda Item 7: Election of Chairperson

Agenda Item 8: Any Other Business

1. REVIEW OF SIGNIFICANT INTERNATIONAL AVIATION DEVELOPMENTS

1.1 ICAO UPDATE

1.1.1 The NAT SPG was informed about recent significant international aviation developments and took note of the latest adopted amendments and proposals for amendment to a number of ICAO Annexes and documents, publication of new ICAO Documents and forthcoming ICAO global and NAT Region-related meetings.

1.2 ICAO BUSINESS PLAN 2020-2022

1.2.1 The NAT SPG noted the draft ICAO Business Plan for the next triennium and in particular the planned measures to improve operational efficiencies and reduction of costs. It was noted that there could be travel budget reductions imposed on the EUR/NAT Office of ICAO in the next triennium that may limit the Office capacity to deliver and support some of the NAT activities. The Secretariat commented that in view of these potential reductions, the scope of the Secretariat support to some of the NAT groups might need to be revisited. Other cost-saving measures may include a wider use of teleconferences and avoidance of meeting locations that would require business class travel by ICAO personnel. This discussion would take place under the auspices of the NAT SPG and its contributory bodies, once the outcomes of the ICAO 40th Assembly (Montréal, 24 September – 4 October 2019) were known.

1.2.2 In this regard, the NAT SPG highlighted the importance of the ICAO Secretariat support for the efficient implementation of the NAT work programme, ensuring consistency, continuity and neutrality of the NAT Region coordination processes. While acknowledging and supporting the need for continuous optimisation and cost efficiency, these measures should not be detrimental to the overall progress of the NAT initiatives that aim at enhancing safety, increasing capacity and reducing the environmental impact in the NAT. To that end, the impact of any proposed costs-reduction measures on the effectiveness of the NAT Regional implementation programme should be carefully assessed so that the NAT future capabilities to implement the ICAO global plan and provisions would not be compromised. A question was raised concerning the ratio of budget allocation for the European (EUR) and NAT Regions and it was noted that such figures were not available.

1.3 STATUS OF NAT SPG CONCLUSIONS

1.3.1 The NAT SPG reviewed the status of the NAT SPG Conclusions. It was noted that all of the Conclusions had either been addressed or presented for discussion and documented in this report. The updated list of Conclusions status is provided at **Appendix C**.

1.3.2 The NAT SPG also noted that the following NAT SPG/55 Conclusions had been approved by correspondence prior to the current meeting:

NAT SPG Conclusion 55/1 – NAT documentation update in support of the ASEPS trials

That, to support the operational trial of Advanced Surveillance Enhanced Procedural Separation (ASEPS) using Space-Based Automatic Dependent Surveillance-Broadcast (SB ADS-B), the ICAO Regional Director, Europe and North Atlantic, take appropriate measures to publish the following documents by January 2019:

a) NAT OPS (Operations) Bulletin – Trial Implementation of ASEPS using ADS-B (Serial no: 2018_006);

b) NAT OPS Bulletin - Special Procedures for In-flight Contingencies (Serial no: 2018_005); and

c) amendment to the *North Atlantic Operations and Airspace Manual* (NAT Doc 007).

NAT SPG Conclusion 55/2 – NAT OPS Bulletins on Expanded Publication of PBCS OTS and NAT Waypoint Insertion / Verification Special Emphasis Items

That the ICAO Regional Director, Europe and North Atlantic:

a) take appropriate measures to publish the NAT OPS Bulletin - NAT Waypoint Insertion / Verification Special Emphasis Items (Serial no: 2018_003) and NAT OPS Bulletin on Implementation of Performance Based Separation Minima - Expanded Publication of Performance-based Communication and Surveillance (PBCS) Organized Track System (OTS) (Serial no: 2018_004); and

b) delete NAT OPS Bulletins Serial No.: 2012_026, 2012_030, 2014_006, 2015_003, 2017_003 and 2018_001_Rev1.

NAT SPG Conclusion 55/3 – Amendment to the NAT event categories reported to the NAT CMA and Extension of NAT DEMA Replacement Project Team

That the NAT SPG:

a) agree that, with the introduction of the Deviations and Error Monitoring Application (DEMA) replacement, all NAT event reports will be notified to the Central Monitoring Agency (CMA) categorised with a 'high level' event type of Vertical, Lateral, Longitudinal loss of separation or Air Traffic Control (ATC) Coordination and any subsequent events within these categories e.g. erosion of separation or contingency would be identified and recorded further into the analysis process;

b) agree that with the introduction of the DEMA replacement, only events which occur wholly or partially within NAT High Level Airspace (HLA) will be reported to the NAT CMA;

c) agree that with the introduction of the DEMA replacement, Turnback/Diversion events which are correctly handled by the crew and ATC, and caused no lateral or vertical errors or losses of separation, will not be reported to the NAT CMA; and

d) agree an extension to the Project Period to 30 June 2019 and revise the deployment date of the new database to 'Prior to NAT SG/21' (North Atlantic Scrutiny Group) .

1.4 REVIEW BY THE AIR NAVIGATION COMMISSION OF THE NAT SPG/54 REPORT

1.4.1 The NAT SPG noted the outcome of the NAT SPG/54 review by the Air Navigation Commission (ANC) (AN Min. 209-5 refers).

1.5 REVIEW BY THE COUNCIL OF THE REPORTING STRUCTURE AND TERMS OF REFERENCE, FUNCTIONS, AND PARTICIPATION OF THE PIRGS AND RASGS

1.5.1 The NAT SPG was informed about the review of the Planning and Implementation Regional Groups/Regional Aviation Safety Groups (PIRGs/RASGs) generic terms of reference (ToR), as conducted by the ICAO Secretariat and approved by the Council. It was noted that this work had been initiated to address the lack of attendance by some States and align the PIRGs/RASGs work prorgammes with the ICAO *Global Air Navigation Plan* (GANP, Doc 9750) and *Global Aviation Safety Plan* (GASP, Doc 10004). The generic ToRs were intended to serve as a baseline document and the Regions were permitted to further expand on them depending on the regional specificities. The Secretariat informed that an initial cross-verification versus the NAT SPG ToR had been done which did not reveal any discrepancies from the generic ToRs. The Secretariat would continue this work and present proposals for NAT SPG ToR amendments to the next meeting, if necessary.

1.6 OUTCOME OF THE FIRST ATLANTIC COORDINATION MEETING (ACM/1)

1.6.1 The NAT SPG was informed that in follow up to NAT SPG Conclusion 54/5, the First Atlantic Coordination Meeting (ACM/1) was held in Paris, France on 31 January 2019. ACM/1 was attended by representatives from fourteen (14) States and six (6) Organizations. ACM/1 discussed the existing implementation challenges and areas where improved coordination and harmonisation between NAT and the South Atlantic (SAT) would be beneficial.

1.6.2 It was noted that ACM/1 agreed on a prioritised list of joint projects, including contingency plans, reduced separation minima based on Performance Based Communications and Surveillance (PBCS) / Performance Based Navigation (PBN) and Space-based Automatic Dependent Surveillance – Broadcast (SB ADS-B) implementation. Other concerns were noted, especially in the area of contingency plans and procedures, High Frequency Communication (HF COM) issues for flights transiting from the Africa-Indian Ocean (AFI) Flight Information Regions (FIR) to Piarco FIR, high number of flights not being able to operate on their optimal flight levels and the operation of non-RVSM (Reduced Vertical Separation Minimum) approved aircraft in RVSM airspace.

1.6.3 The NAT SPG noted that the project on harmonisation of contingency plans was led by the United Kingdom with an objective to deliver an updated SAT Contingency Plan, using the *Air Traffic Management Operational Contingency Plan - North Atlantic Region* (NAT Doc 006) as a basis. As a result, the updated SAT Contingency Plan was approved by the SAT/24 meeting (3 to 7 June 2019). In addition, through the assistance of the EUR/NAT Office and the United States, information papers sharing the NAT experience on the PBCS and SB ADS-B implementation had been prepared for SAT/24.

1.6.4 The NAT SPG was encouraged by some of the SAT/24 outcomes, in particular those aiming at improving coordination and cooperation with the NAT structures. Canada informed about their coordination with Agency for Aerial Navigation Safety in Africa and Madagascar (ASECNA)) regarding SB ADS-B implementation and their readiness to take up the SB ADS-B project lead responsibility, if required. In this regard, it was noted that nomination of SAT co-leads for the 3 joint projects was still pending.

1.6.5 The NAT SPG supported the continuation of coordination efforts with the SAT. To that end, the proposal to convene the next ACM in Trinidad and Tobago in February 2020 was supported by the NAT SPG.

1.7 Volcanic Ash Exercises

1.7.1 The NAT SPG was provided a summary of the Volcanic Ash Exercises in the EUR/NAT Regions. The VOLCEX18 (Volcanic Ash Exercises for the EUR Region) Exercise Scenario involved a simulated eruption of Öræfajökull, Iceland at 0200 UTC (Universal Time Coordinated) on 25 November 2018 that eventually impacted the British Isles, a large part of Continental Europe and east to the Russian Federation and west into the Canadian FIRs. The Exercise took place on 28 November 2018 from 0800-1600 UTC.

1.7.2 The VOLCEX19 would simulate a volcano eruption of Vesuvio, Italy. VOLCEX19 was planned to take place on 20 November 2019 from 0800-1600 UTC. The simulated volcanic ash cloud was expected to impact multiple EUR States, possibly reaching the eastern Mediterranean. To assist in preparing for the exercise, the VOLCEX19 Preparatory Workshop would be held from 1400 local time on 2 October to close of business on 3 October 2019 in Paris. The final exercise directive was expected to be available by 29 October 2019.

1.7.3 The VOLKAM19 (Volcanic Ash Exercises for the (far) Eastern part of the EUR Region) Exercise Scenario involved a simulated eruption of Opala, Kamchatka in the Russian Federation that produced a simulated volcanic ash cloud to flight level (FL) 450 which moved south-east, impacting the trans-east, North Pacific (NOPAC) and Pacific Organized Track System (PACOTS) routes. In addition, a simulated eruption of Ushkovsky, Kamchatka produced a simulated volcanic ash cloud to FL 250 that moved north-west to impact the trans-east route and some cross-polar routes, (this impacted some aircraft due to decompression constraints). VOLKAM19 took place from 2200 UTC on 18 April 2019 to 0200 UTC on 19 April 2019. This scenario left a corridor of ash free airspace of several hundred kilometres width in south-central Kamchatka. This exercise allowed national supervisory authorities, service providers and airspace users to practice their response to volcanic eruptions. The International Air Transport Association (IATA) emphasized the importance of dynamic airborne reroute procedures (DARP) in regard to volcanic ash occurrences. The point was also raised that an update to global procedures would be needed to allocate the responsibility for amended flight plan distribution under such circumstances to enable efficient DARP procedures (NAT SPG Conclusion 53/13 *(Development of ICAO Provisions concerning Coordination of Re-routes Involving Multiple FIRs)* also refers).

1.8 Update on Cybersecurity in the EUR/NAT Region

1.8.1 The NAT SPG was provided with an update on the ongoing work at ICAO on cybersecurity as well as information related to the development of a Cybersecurity Strategy and available awareness and training packages. In this regard, the Group recalled NAT SPG Conclusion 54/23 inviting the North Atlantic Safety Oversight Group (NAT SOG) and North Atlantic Implementation Management Group (NAT IMG) to undertake a review of the EUR/NAT GASeP (*Global Aviation Security Plan* (Doc 10118)) Implementation Roadmap and propose NAT Region coordinated follow up actions. The NAT SPG noted that in follow up to the foregoing Conclusion, the NAT SPG contributory bodies had been provided with the EUR/NAT GASeP Roadmap and the global cybersecurity risk methodology. Also, the NAT IMG and NAT SOG Chairmen, with the support of the Secretariat, arranged a teleconference with the Secretary of the ICAO Secretariat Study Group on Cybersecurity (SSGC) to discuss potential NAT Region actions. Based on these consultations, the NAT States were encouraged to share their experience and lessons learnt on cybersecurity. Further discussions on implementation of Conclusion 54/23 would take place once the ICAO 40th Assembly endorsed the ICAO cybersecurity strategy that would provide further guidance on this matter.

2. NAT PLANNING AND IMPLEMENTATION PROGRAMMES

2.1 DATA LINK AVAILABILITY

2.1.1 The NAT SPG was informed about conclusions made in response to the NAT IMG Decision 50/5 (Availability parameter of Required Communication Performance (RCP) 240 and Required Surveillance Performance (RSP) 180) that under the observed data link availability conditions, the application of data link dependent separations could continue to be safely applied by all air navigation service providers (ANSPs) within the NAT Region. Various effects of outages had not resulted in an impact that compromised safe operations primarily due to the mitigation measures implemented by the NAT ANSPs as part of their safety management systems. At the same time, it was also emphasised that the foregoing should not lead to complacency and the collaborative efforts with the Communications Service Providers (CSP) and Satellite Service Providers (SSP) would continue under the NAT umbrella and at the ICAO global level to improve data link availability in order to reduce the need for controllers to apply operational mitigations to counter the technical availability issues.

2.1.2 In this respect, it was noted that, due to redundancy currently built into the Inmarsat system, failures of certain components in the system did not always have significant operational consequences. However, due to the expected de-orbiting by 2020-2021 of the I-3 satellite currently providing additional coverage over NAT, this coverage redundancy could be lost and the NAT data link availability issues could become more salient. In addition, the remaining two I-4 satellites over the NAT would provide less coverage in the northern latitudes.

2.1.3 The NAT SPG supported the proposed action to address this potential degradation and invited Inmarsat to consider the current and future NAT data link service availability issues, in particular due to the imminent de-orbiting of the existing I-3 satellite, and to plan for necessary measures to ensure compliance with PBCS availability requirements. In this regard, the NAT SPG also noted that a number of improvements included in the NAT 2030 Vision relied on the data link performance meeting appropriate PBCS requirements.

2.1.4 Based on the above, the following was agreed:

NAT SPG Conclusion 55/4 – Inmarsat satellite coverage redundancy over the NAT

That, the NAT SPG, having recognised the importance of ensuring appropriate satellite coverage redundancy over the NAT for the successful implementation of the NAT service improvement programmes, and in view of the expected I-3 decommissioning, invite the ICAO Regional Director, Europe and North Atlantic, to address Inmarsat on behalf of the NAT Region to:

a) consider the current and future NAT data link service availability issues, in particular due to the imminent de-orbiting of the existing I-3 satellite; and

b) plan for necessary measures to ensure compliance with Performance-based Communication and Surveillance (PBCS) requirements and satellite coverage redundancy over the NAT.

2.1.5 In this regard, the NAT SPG noted with appreciation a presentation by Inmarsat on their system availability design, outages detection and notification, and availability calculation.

2.2 PBCS MONITORING FRAMEWORK

2.2.1 The NAT SPG was presented with a proposal to further standardise the NAT PBCS monitoring framework through the establishment, by 1 July 2019, of a monthly reports to be submitted to the NAT Central Monitoring Agency (NAT CMA), using a standardised template, to identify non-performing aircraft that filed a PBCS capability at least once during a monthly reporting period.

2.2.2 In this regard, the NAT SPG noted that the methods for identification of non-performing aircraft needed to be harmonised across the NAT and that the NAT SOG established a Project Team to review and harmonize the NAT ANSPs' and States' practices on notification of non-performance through the NAT CMA and global Regional Monitoring Agencies (RMA) network. The membership of the Project Team would include appropriate experts from States dealing with flight operations regulations and oversight.

2.2.3 The NAT SPG noted that there was limited guidance on the above-mentioned aspects in ICAO documentation and that the outcome of the NAT SOG work could be then channelled into the appropriate ICAO global forums for further consideration.

2.2.4 The NAT SPG also noted concerns about refusal by some aircraft operators to provide log-files to the NAT Data Link Monitoring Agency (NAT DLMA) for the purpose of investigating data link problem reports. The initial proposal to use the NAT CMA and the global RMAs network for communicating such occurrences to appropriate States of operators/registry was discussed. It was agreed that this issue needed further investigation by NAT SOG and consultations between NAT CMA and DLMA. In the interim, as a potential alternative, it was proposed that ICAO EUR/NAT State letters could be issued to the appropriate authorities in such situations.

2.2.5 Furthermore, the NAT SPG agreed that the North Atlantic Technology and Interoperability Group (NAT TIG) and NAT CMA ToRs would need to be reviewed with a view to allow direct communication between them on technical exchange concerning the relevant data on the PBCS reports. In this regard, it was noted that the type of coordination that needed to take place between the NAT TIG and NAT CMA was part of normal process and this was encouraged between all NAT SPG contributory bodies. However, updates to ToRs would be required whenever commitment of additional resources was required by NAT SPG members.

2.2.6 Based on the above, the following was endorsed:

NAT SPG Conclusion 55/5 – Monthly PBCS reports to NAT CMA by the NAT ANSPs

That:

a) the NAT air navigation service providers (ANSPs) establish monthly Performance-based Communication and Surveillance (PBCS) reports to the NAT Central Monitoring Agency (CMA), by 1 July 2019, to identify fleets and aircraft that filed PBCS indicators at least once during the reporting period and were not meeting the 95% performance criteria for Required Communication Performance (RCP) 240 and Required Surveillance Performance (RSP) 180, and report to the NAT CMA using a standardized format as provided in **Appendix D**;

b) the NAT SOG investigate ways and means to assist the NAT Data Link Monitoring Agency (DLMA) in receiving log-files for the purpose of investigating problem reports where aircraft operators have refused to provide them; and

c) the NAT IMG and NAT SOG review the NAT TIG and NAT CMA Terms of Reference (ToRs) with a view to allow direct communication between them on technical exchange concerning the relevant data on the PBCS reports.

2.3 UPDATE TO THE NAT SPG CONCLUSION 49/05 (NAT PBCS REQUIREMENTS)

2.3.1 The NAT SPG was presented with a proposal to update the NAT SPG Conclusion 49/05 *(RCP and RSP for RLatSM and RLongSM)* that allowed the acceptance of the transaction time and surveillance data delivery time at a level of 99.0% rather than at the specified 99.9% for the Reduced Lateral Separation Minimum (RLatSM) and Reduced Longitudinal Separation Minimum (RLongSM). It was agreed that Conclusion 49/5 should be repealed and a new one endorsed to take account of the completion of the trials and commencement of the operational implementation.

2.3.2 Therefore, the following was endorsed:

NAT SPG Conclusion 55/6 – NAT PBCS Requirements

When separation minima predicated on Required Communication Performance (RCP) 240 and Required Surveillance Performance (RSP) 180 is applied in the NAT, the following additional provisos shall apply:

a) When the actual communication transaction time or surveillance data delivery time does not meet the 95% values, appropriate action should be taken to improve performance to an acceptable level before providing the air traffic service (ATS) function predicated on RCP/RSP;

b) The 99.9% values provide a target value for design changes to the overall system to improve performance;

Note 1 – Guidance concerning RCP and RSP specifications, application and performance requirements, including elements to be considered when calculating the 99.9% value, can be found in the Performance-based Communication and Surveillance (PBCS) Manual (ICAO Doc 9869);

Note 2 – With regards to the 99.9% criteria, if the performance is less than 99%, contact the data link monitoring agency (DLMA), operator and/or communications service provider (CSP) to determine any action that can improve the performance;

and

c) When the actual communication transaction time or surveillance data delivery time does not meet the 99.9% target value, the air navigation service provider (ANSP) should assess the effects of actual performance against local factors, such as increased controller workload, increases in fleet equipage and expanded use of the data link services and implement appropriate controls and mitigation measures as appropriate.

2.4 VERTICAL LIMIT FOR DATA LINK MANDATE PHASE 2C

2.4.1 The NAT SPG was presented with a proposal to amend the NAT Data Link Mandate (DLM) Phase 2C by capping the DLM airspace at FL 410 in order to accommodate aircraft operators that cannot be data link equipped. It was noted that this action would not compromise the NAT DLM objectives as the number of non-DLM flights was expected to be 5% or less. In addition, it would align the DLM vertical limits with the vertical limits of the HLA and RVSM airspace.

2.4.2 It was noted that NAT SOG discussed whether a safety assessment was required for this change and agreed that it was not required as the change had been initiated for clarification purposes.

2.4.3 Therefore, the following was endorsed:

NAT SPG Conclusion 55/7 – PfA to NAT Doc 007, v.2019_3 related to upper limit for NAT DLM Phase 2C

That the ICAO Regional Director, Europe and North Atlantic, take appropriate actions to publish the following NAT SPG-endorsed documents following the NAT SPG endorsement of the upper limit of FL 410 (inclusive) for NAT Data Link Mandate (DLM) Phase 2C:

a) amendment to the *North Atlantic Operations and Airspace Manual* (NAT Doc 007) regarding the vertical dimensions of NAT DLM Phase 2C as provided in **Appendix E**; and

b) updated NAT OPS Bulletin 2017_001 addressing the vertical dimension of NAT DLM Phase 2C as provided in **Appendix F**.

2.5 SOUTH EAST CORNER UPDATES

2.5.1 The NAT SPG was provided a progress report on the implementation of NAT SPG Conclusion 53/01 (NAT DLM Phase 2B and Tango Routes) that set out the requirements for the introduction of ATS surveillance, VHF (very high frequency) services and NAT South East Corner airspace changes to achieve continuous access to this airspace by those aircraft unable to comply with the NAT DLM.

2.5.2 It was noted that the Concept of Operations (CONOPS) and implementation plan to meet the NAT SPG requirements had been developed by Ireland and the United Kingdom in coordination with France and Spain. The implementation plan consisted of two phases. The first phase concerned the implementation of ATS surveillance using SB ADS-B and a VHF channel on 128.360 (for urgency and contingency purposes only). The first phase would be used for data gathering and additional amendments to the implementation plan would be presented at a later stage, if required. The second phase was about implementation of global navigation satellite system (GNSS) separation minima (lateral separation of aircraft on parallel or non-intersecting tracks or ATS routes with a minimum spacing of 27.8 km (15 NM), and longitudinal separation of aircraft at the same cruising level on the same track of 37 km (20 NM) on T9 and T290 routes from 30 January 2020 onwards.

2.5.3 The North Atlantic Procedures and Operations Group (NAT POG) was working on appropriate amendments to the NAT Doc 007 and harmonised aeronautical information publication (AIP)/aeronautical information circular (AIC) publications. Further updates would be presented to the next NAT IMG and NAT SOG meetings.

2.6 NAT UPLINK LATENCY TIMER (ULT) AND RCP 240 MANDATE

2.6.1 The Group was presented with the outcome of the work performed by the NAT Uplink Latency Timer Project Team (ULT PT) that was established per NAT SPG Conclusion 54/3 to “review and investigate potential corrective actions by CSPs, air operators, and ANSPs to avoid pilots acting on “old” Controller Pilot Data Link Communications (CPDLC) uplink messages”.

2.6.2 It was recalled that the interim ULT PT report had been presented to the NAT SPG and its recommendations agreed via correspondence. In order to formalise this previous agreement, the following was endorsed:

NAT SPG Conclusion 55/8 – Implementation of the uplink latency timer function by NAT ANSPs

That:

a) NAT air navigation service providers (ANSP) implement the message “SET MAX UPLINK DELAY VALUE TO [seconds] SEC” on or after 24 May 2018 to give aircraft operators two AIRAC (Aeronautical Information Regulation And Control) cycles to distribute guidance material to flight crews;

b) the value in the uplink message in a) above be 300 seconds on a trial basis and the NAT IMG monitor the trial and report findings and proposals on the way forward to the NAT SPG; and

c) the NAT OPS Bulletin with guidance material concerning the CPDLC Uplink Message Latency Monitor Function (NAT OPS Bulletin 2018_002) be published.

2.6.3 After the submission of the interim report, the ULT PT had been working on the second task of its Terms of Reference: “Consider the viability of implementing a network uplink message expiration timer”. It was noted that the ULT PT estimated about 80% of Future Air Navigation System (FANS) 1/A equipped aircraft were fitted with a correctly functioning uplink message latency monitor function. Assuming that the uplink message latency monitor function would be implemented by all NAT ANSPs in accordance with the NAT SPG decision, it could therefore also be assumed that about 20% of FANS equipped aircraft would not be protected from receiving, and the pilot acting on, delayed uplink messages.

2.6.4 The NAT SPG noted that work was underway by aircraft manufacturers to develop amendments to make some of those aircraft compliant and updates to non-compliant FANS 1/A equipped general aviation aircraft should be available by mid-2019. It could therefore be anticipated that the number of aircraft with incorrectly working uplink message latency monitor function or without such a function at all would gradually reduce over time.

2.6.5 It was recalled that, according to the RCP 240 specification, a correctly working latency monitor function was required for RCP 240 approval.

2.6.6 The NAT SPG noted the ULT PT recommendations that the situation of the 20% portion of the FANS fleet that did not have a correctly working uplink message latency monitor function could be addressed by one of the following options:

a) By implementation of a network uplink message expiration timer by CSPs and SSPs to instruct the network to cease uplink message delivery attempts after a specified time (for example 300 seconds). This change would have world-wide effect and would need to be agreed by and coordinated through the appropriate ICAO and industry groups. It could however be expected that the change would be a significant undertaking that would take several years to achieve. The feasibility, complexity and cost of this implementation have not been examined by the NAT ULT PT; that would need to be examined by the appropriate industry groups if the NAT opts for this option.

b) By expanding the NAT data link mandate to require all data link equipped aircraft in the NAT Region to be RCP 240 compliant by a certain date and therefore carry a correctly working latency monitor function. This would serve to expedite equipage of correctly working uplink message latency monitor functionality in FANS aircraft in the NAT Region.

c) By the NAT deciding that the risk of late uplink message delivery be only addressed for functions that are dependent on RCP 240 (for example 23 NM lateral separation and 5 minutes longitudinal separation). This would effectively continue for 20% of the FANS aircraft population; the situation that has been prevailing in the NAT since FANS services were implemented. The number of these aircraft would then gradually reduce over time. If this stance was taken, then no further actions would be required in the NAT except to ensure implementation of the “SET MAX UPLINK DELAY VALUE TO 300 SEC” message by ANSPs and for regulators to ensure that aircraft do not get RCP 240 approvals without a correctly working uplink message latency monitor function. When considering this option, it should however be kept in mind that application of other separation minima, most notably 1000 feet vertical separation, can be at risk from pilots acting on delayed messages.

2.6.7 The NAT SPG reviewed and discussed the NAT IMG/53 recommendation mandating RCP 240 in the NAT DLM airspace effective 23 January 2025. The NAT SPG determined that, based on the primary rationale of it being a means to address issues with the Uplink Message Latency Monitor functionality and taking into account that there were a number of other practical issues that were in the process of being addressed regarding application of RCP 240, an RCP 240 mandate was not appropriate at this time. Further consideration of the regional impact of an RCP 240 mandate would need to be undertaken. Understanding the risk of “old” CPDLC uplink messages being acted upon by pilots of certain fleet type(s), the NAT SPG directed the NAT IMG to monitor aircraft equipage to determine the number of aircraft that did not have a PBCS-compliant Message Latency Monitor function. Further, the NAT IMG should continue to investigate if there were other mitigation measures available.

2.6.8 The NAT SPG agreed that the ULT PT had finished its assigned work as specified in the Terms of Reference for the NAT Uplink Latency Timer Project Team. In doing so, the NAT SPG expressed its appreciation for the quality of the work that the PT had carried out.

NAT SPG Conclusion 55/9 – Outcomes of the NAT ULT PT

That:

a) the NAT IMG monitor aircraft equipage to determine the number of aircraft that do not have a PBCS-compliant Message Latency Monitor function and continue to investigate if there are other mitigation measures available; and

b) recognising that the NAT ULT PT objectives have been met, the Uplink Latency Timer Project Team be disbanded.

2.7 OPERATIONAL TRIAL OF ASEPS USING SB ADS-B

2.7.1 The NAT SPG was informed that in follow up to NAT SPG Conclusion 54/9, the NAT IMG/53 and NAT SOG/19 carried out an analysis of all the pre-requisites contained in NAT SPG Conclusion 53/5 and agreed that all of the pre-requisites had been met for the Operational Trial of ASEPS using SB ADS-B in the longitudinal dimension to start on 28 March 2019.

2.7.2 Concerning the safety cases, it was noted that per NAT SOG Decision 19/03 (*Monitoring of NAT Safety Case - Operational Trial of ASEPS Using ADS-B*), it was agreed that the implementing States complete the NAT Safety Case prior to the Trial implementation date and provide the finalized NAT Safety Case to the NAT SOG by correspondence. Subsequently, on 27 March 2019, the NAT SOG members were in receipt of an email from the ICAO Regional Office informing that they had received a letter from the implementing States’ Regulators (Canada and United Kingdom) confirming their acceptance of the safety management activities of ANSPs concerning the commencement of the Operational Trial of ASEPS using ADS-B. Portugal informed that work was in progress and the outcome would be presented through the NAT SPG working structure. Therefore, the conditions of the NAT SPG Conclusion 53/5 had been fulfilled and the trial could proceed as agreed on 28 March 2019.

2.7.3 Following the positive outcome from the NAT IMG/53 and NAT SOG/19 meetings, the NAT SPG Conclusion 55/1 was endorsed by correspondence and the following documents were published:

a) *NAT OPS Bulletin – Trial Implementation of ASEPS using ADS-B* (Serial no: 2018_006);

b) *NAT OPS Bulletin - Special Procedures for In-flight Contingencies* (Serial no: 2018_005); and

c) amendment to the *North Atlantic Operations and Airspace Manual* (NAT Doc 007).

2.7.4 Therefore, the operational trial of ASEPS using ADS-B in the longitudinal dimension commenced in the NAT on 28 March 2019.

2.7.5 Furthermore, the NAT SPG was presented with updates to the Implementation Plan for Operational Trial of ASEPS using ADS-B, and the draft NAT Operations (OPS) Bulletin addressing the expansion of the ASEPS Operational Trial to include lateral spacing of 19 NM between non-intersecting tracks.

2.7.6 Concerning the safety cases, it was noted that NAT SOG/20 was presented with a draft Safety Case covering Shanwick and Gander Oceanic Control Areas (OCA) and identified no issues requiring resolution before an operational trial should commence for ASEPS lateral. The final safety cases would be submitted to the NAT SOG by correspondence and pending that submission, it was agreed that, all of the pre-requisites for NAT SPG Conclusion 54/9 had either been satisfied or a process had been put in place to ensure that they would be satisfied prior to the implementation date of the Operational Trial of ASEPS using SB ADS-B in the lateral dimension within Gander and Shanwick OCAs.

2.7.7 Therefore, following the successful commencement of the ASEPS Longitudinal Separation Operational Trial on 28 March 2019, it was agreed that the date to commence the Lateral Separation Operational Trial would be 10 October 2019. The NAT OPS Bulletin would be published by 15 August 2019 together with State AICs which would allow for 2 AIRAC cycles notice.

2.7.8 Consequently, the following was endorsed:

NAT SPG Conclusion 55/10 – Updates to ASEPS Implementation Plan and Task List and approval of NAT OPS Bulletin - Trial Implementation of ASEPS (Lateral) using ADS-B

That, the NAT SPG, having agreed that the implementation date for the ASEPS lateral separation of 19 NM operational trial would be 10 October 2019, invite the ICAO Regional Director, Europe and North Atlantic, to take appropriate actions to publish the:

a) Implementation Plan and Task List For An Operational Trial Of Advanced Surveillance-Enhanced Procedural Separation (ASEPS) Using Automatic Dependent Surveillance-Broadcast (ADS-B) as provided in **Appendix G**; and

b) NAT Operations (OPS) Bulletin addressing the operational trial of ASEPS to include a minimum of 19 NM lateral separation between non-intersecting tracks using ADS-B (Serial no: 2019_002) as provided in **Appendix H**.

ASEPS – ATS surveillance service

2.7.9 The NAT SPG was informed about discussions relating to paragraph 2.3 in the NAT OPS Bulletin (2018_006) on the trial implementation of ASEPS using ADS-B stating "*Flight crews are expected to comply with normal non-surveillance procedures, which include position reports via voice or ADS-C* (Automatic Dependent Surveillance-Contract)*, and all other operator specific procedures currently used.*" and the question of whether surveillance services should be terminated for ADS-B aircraft that transitioned into airspace where space-based ADS-B surveillance service was provided and ASEPS was applied.

2.7.10 It was acknowledged that this confusion may have been caused by the ASEPS "working title" that was adopted early on by the ICAO Separation and Airspace Safety Panel (SASP). However, that working title was not carried over to the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) proposal for amendment where the new separation minima would be named "Separation minima using ATS surveillance systems where VHF voice communication is not available" and placed in Chapter 8 on ATS Surveillance Services.

2.7.11 It was noted that, based on consultation with IATA and the International Federation of Air Line Pilots' Associations (IFALPA), all NAT ANSPs currently terminated surveillance services for aircraft that were provided with ATS surveillance service and then transitioned into airspace where space-based ADS-B surveillance service was provided and ASEPS was applied. The NAT SPG noted the NAT IMG debates on whether this application during the trials was in line with PANS-ATM (Doc 4444) or whether identification should be maintained and surveillance services should not be terminated with those aircraft.

2.7.12 In this regard, the NAT SPG agreed with the NAT IMG and NAT SOG conclusion that there was no current evidence to indicate that there were any safety issues involved in continuing the trial unchanged. It was also noted that there had been no reports of pilot or controller confusion regarding the services and procedures provided. Therefore, the following was endorsed:

NAT SPG Conclusion 55/11 – ASEPS phraseology and definitions

> That, the NAT SPG, having noted the differences in interpretation of the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) provisions concerning identification of ADS-B aircraft and the termination of surveillance services for aircraft transitioning into airspace where space-based ADS-B surveillance service is provided and ASEPS is applied, agreed that no evidence has been presented that indicates that there was unmitigated risk involved, and therefore the trial implementation of ASEPS using ADS-B in the NAT should continue.

2.8 AIREON ALERT

2.8.1 The NAT SPG was provided with an update on the Aireon Aircraft Locating and Emergency Response Tracking (ALERT) developments. It was recalled that ALERT was a free global aircraft tracking solution that would allow for Rescue Coordination Centres (RCC), ANSPs and Authorised Customers to request information on the location of any ADS-B aircraft in distress. Once a stakeholder had registered and been approved to use Aireon ALERT, should an emergency arise, it could contact the 24/7/365 operations facility to obtain the last known position of the aircraft. This would include a map of the last 15 minutes of flight, with one plot per minute and a 4-dimensional report including altitude, latitude, longitude and time information. Based on the situation, additional tracking information may also be provided. Detailed Aireon ALERT surveillance data may also be available on request to support post incident analysis and investigation by State authorities.

2.8.2 The Aireon ALERT system was available for registration and following the completion of Aireon satellite infrastructure on 9 July 2019, it would go into full operational service, which would be operated from the Irish Aviation Authority (IAA) North Atlantic Communications Centre in Ballygirreen, County Clare, Ireland.

2.8.3 The NAT SPG noted that to pre-register for Aireon ALERT, ANSPs, Aircraft Operators, Regulators and Search and Rescue Organizations should visit **www.aireonalert.com**. The Group agreed that improving awareness about the availability of the free service for pre-registered ANSPs, aircraft operators, regulators and search and rescue organizations would contribute to safety enhancements in the NAT. Furthermore, the ICAO Regional Director, Europe and North Atlantic, was requested to support a global advocacy of the availability of the free Aireon ALERT service.

2.8.4 Accordingly, the following was endorsed:

NAT SPG Conclusion 55/12 – Availability of free Aireon ALERT service

> That the ICAO Regional Director, Europe and North Atlantic, take appropriate measures to raise awareness among NAT airspace user States about the availability of the free Aireon Aircraft Locating and Emergency Response Tracking (ALERT) service for pre-registered air navigation service providers (ANSPs), aircraft operators, regulators and search and rescue operations.

2.9 OPERATIONS WITHOUT AN ASSIGNED FIXED SPEED (OWAFS)

2.9.1 The NAT SPG was presented with the outcome of the discussions regarding the implementation of Operations Without an Assigned Fixed Speed (OWAFS) in the NAT. It was recalled that NAT IMG/50 established the OWAFS project team to facilitate a coordinated introduction of clearances in the NAT Region without an assigned fixed speed.

2.9.2 The OWAFS project team met (via teleconference) 13 times since its inception and produced a CONOPS, implementation plan and task list, and a NAT OPS Bulletin to support the NAT OWAFS implementation. In an effort to validate the project team findings and to assess flight crew training and potential traffic issues, a trial of the use of "RESUME NORMAL SPEED" phraseology was conducted by some NAT ANSPs. The trial began on 1 July 2018, with eastbound flights and one operator participating. The outcome of the trial was provided to the ICAO Operational Data Link Specific Working Group (OPDLWG) for its consideration as part of the effort to clarify, in the *Global Operational Data Link Manual* (GOLD, Doc 10037), the meaning of the phraseology "RESUME NORMAL SPEED" in the context of airspace where variable Mach (ECON) operations may be used.

2.9.3 IATA asked that Portugal be recognised for their willingness to step forward and suggest a trial of "RESUME NORMAL SPEED" that had been instrumental in the overall success of OWAFS.

2.9.4 The NAT SPG agreed that the OWAFS procedure, which was in accordance with the provisions of the PANS-ATM (Doc 4444), be adopted in the NAT. It was noted that OWAFS would provide efficiencies, with no significant impact on normal NAT operations, and represented a safe and sustainable procedure for NAT ANSPs to provide operators with flight operations without an assigned speed unless specially required for application of separation.

2.9.5 The NAT SPG noted that the implementation dates for the NAT ANSPs were included in the Task list with the NAT-wide implementation planned to be completed in the first quarter of 2020.

2.9.6 Therefore, the following was endorsed:

NAT SPG Conclusion 55/13 – Operations Without an Assigned Fixed Speed (OWAFS) in the NAT – CONOPS and NAT OPS Bulletin - OWAFS in the NAT

That the ICAO Regional Director, Europe and North Atlantic take appropriate measures to publish the NAT SPG-endorsed:

a) *Concept of Operations for the Provision of Operations Without an Assigned Fixed Speed (OWAFS) in the North Atlantic Region* as shown in **Appendix I**;

b) *NAT OPS Bulletin – Operations Without an Assigned Fixed Speed (OWAFS) in the NAT* (Serial no: 2019_001) as provided at **Appendix J**; and

c) the timelines for implementation, as per the Task List provided at **Appendix K**.

2.10 DATA LINK PERFORMANCE REPORT 2018

2.10.1 The NAT SPG noted an update on the NAT data link performance for the two recent 6-month reporting periods (H1/2018 and H2/2018) that was approved by NAT IMG/54 and published, and noted the following highlights:

a) NAT aggregate performance:

   i. the 95% criteria were met for Required Surveillance Performance (RSP) 180 and Required Communication Performance (RCP) 240 for the aggregate NAT and for the individual NAT FIRs;

   ii. the 99.9% criteria were met for RSP 180 and RCP 240 at the currently accepted level of 99.0% for the aggregate NAT and for the individual NAT FIRs.

b) Monitoring results by operator/aircraft type pair:

- There were 1,021 pairs observed using data link in one or more of the NAT FIRs. There were **72 pairs** identified with at least 100 data points and an Actual Surveillance Performance (ASP) below the RSP 180 95% criteria and/or an Actual Communication Performance (ACP) below the RCP 240 95% criteria, in at least 1 of the FIRs.

c) Monitoring results by airframe:

- There were 6,087 airframes observed using data link in one or more of the NAT FIRs. There were **631 airframes** identified with at least 100 data points and an ASP below the RSP 180 95% criteria and/or an ACP below the RCP 240 95% criteria, in at least 1 of the FIRs. Many of these airframes are included as part of a fleet in the operator/aircraft type pair analysis, some of which are also identified as not meeting required performance and others which are observed with different results than the associated fleet.

2.11 RADIO STATIONS NETWORK REPORT 2018

2.11.1 The NAT SPG noted the NAT voice communications consolidated report for 2018 that included a consolidated analysis of the voice message volume of the NAT Aeronautical Radio Stations (per NAT SPG Conclusion 29/13) and an assessment of the voice communications system performance for the Santa Maria Radio Station.

2.11.2 It was noted that the total NAT voice communications traffic of messages using high frequency (HF), general purpose (GP) VHF and satellite voice communications (SATVOICE) media for the aeronautical radio communications stations during 2018 was 2.845.200 with 76.8% by HF, 23% by VHF and 0.2 % on SATVOICE. The percentage of traffic for each station was as follows: Canada (31%), Ireland and Iceland (43%), Portugal (12%), the United States (11%) and Norway (3%).

2.11.3 While Gander, Santa Maria and Bodo reports showed a steady increase in messages since 2015, the report showed an overall decrease of 2.9% compared to 2017 in the volume of air-ground messages. The five year variation on the message volume in the NAT showed an overall decrease of 7.5%.

3. NAT SAFETY PERFORMANCE AND OVERSIGHT ISSUES

3.1 NAT ANNUAL SAFETY REPORT (NAT ASR) FOR 2018

3.1.1 The NAT SPG was provided with the NAT Annual Safety Report (ASR) 2018 for endorsement and approval for publication. It was noted that the NAT ASR 2018 contained information regarding:

a) The North Atlantic Scenario;

b) Safety Policy, as stipulated in the *NAT SPG Handbook* (NAT Doc 001) and its alignment with the ICAO GASP;

c) Vertical and Lateral Collision Risk Estimates, including a comparison with 2016 and 2017 values;

d) Safety Key Performance Indicators (SKPI);

e) Results of the scrutiny of events of year 2018, including the identified contributing issues, the high-level human error types associated to them and the mitigations that were used for preventions; and

f) NAT Regional Priorities, including Space-based ADS-B and Separation minima based on PBCS/PBN.

3.1.2 It was noted that in accordance with NAT SPG Conclusion 53/15 c), the performance of the Collision Risk Estimates against their Target Level of Safety (TLS) in the lateral and vertical domains are reported to the NAT SOG and the NAT SPG, but are not included in the NAT Annual Safety Report.

3.1.3 The following was endorsed:

NAT SPG Conclusion 55/14 – 2018 NAT Annual Safety Report (ASR)

That the ICAO Regional Director, Europe and North Atlantic, take appropriate action to publish the NAT SPG-endorsed NAT ASR 2018 (**Appendix L** refers).

4. NAT ECONOMIC, FINANCIAL AND FORECAST ISSUES

4.1 NAT TRAFFIC FORECAST

4.1.1 The NAT SPG was presented with the NAT Region traffic forecast update for the years 2018-2038. The near-term five-year outlook for NAT Region traffic is expected to grow at an average annual rate of 2.7 percent between 2018 and 2023, a decrease over the 2017-2022 short term growth rate of 3.9 percent reported at the 34th NAT Economic, Financial and Forecast Group (NAT EFFG) meeting. The decrease was due to the Wow air bankruptcy, the 737MAX grounding, and an earlier than expected delivery of aircraft. However, growth will continue but may lessen on a year to year basis.

4.1.2 The long-term forecast, which provides a range of expected growth rates for the NAT beyond 2023, is appended to the near-term forecast. The long-term average annual growth rate forecast ranges from 1.94 percent to 3.3 percent, with 2.9 percent as the central forecast. Combining the near-term forecast with the long-term forecast, the average annual growth rate for the entire period ranges from 2.1 percent at the low end, 3.2 percent at the high end. The central forecast projects a 2.9 percent average annual air traffic growth rate in the NAT for 2018 to 2038.

4.1.3 The NAT SPG agreed that the updated traffic forecast for the NAT Region would be made available in the EUR/NAT public webpages. The supporting traffic data used to create the overall NAT traffic forecast is restricted to the NAT EFFG members, and so is the detailed traffic forecasts (by FIR, by type of airframe, etc.). The NAT EFFG members act as focal points to reply to requests from their respective States about information pertinent to their FIR. The following was endorsed:

NAT SPG Conclusion 55/15 – Approval of the NAT Traffic Forecast

That, the ICAO Regional Director, Europe and North Atlantic, take the appropriate measures to publish the NAT traffic forecast as provided in **Appendix M**.

4.1.4 In this regard, the NAT SPG recalled a previously agreed task for the NAT EFFG to produce annually traffic forecast for the Reykjavik Control Area (CTA) which was essential for the purpose of the DENICE (Danish and Icelandic Joint Financing) agreement. It was noted that the currently provided traffic statistics were provided separately for Reykjavik FIR and Nuuk FIR. However, only partial data for Nuuk FIR was available and provided by Iceland. It was noted that work was continuing in the NAT EFFG to include in the forecast for Nuuk FIR traffic data to be provided by Canada for the portion of Nuuk FIR where ATC is delegated to them.

4.1.5 Concerning the traffic forecast for Reykjavik CTA, the following was endorsed:

NAT SPG Conclusion 55/16 – Provision of Traffic Forecast for Reykjavik CTA

That, the NAT EFFG:

a) provide the latest traffic forecast for Reykjavik CTA by 31 August 2019 by correspondence; and

b) provide annual traffic forecast for Reykjavik CTA at the NAT SPG meetings.

5. NAT DOCUMENTATION UPDATES

5.1 PFA TO NAT SUPPS (DOC 7030)

5.1.1 The NAT SPG was presented with a detailed revision of the NAT *Regional Supplementary Procedures* (SUPPs, Doc 7030/5) conducted in follow up to NAT IMG Decision 52/4 that tasked the NAT POG with the review of the NAT SUPPs (Doc 7030) and to report if there were any gaps, duplications or inconsistencies versus the principles agreed at NAT IMG/48. It was recalled that, per NAT IMG/48, in addition to indicating a mode of implementation of global provisions or permissible additions, the Regional SUPPs also served as a method to formalise regional agreements on implementation of those ICAO provisions for which implementation was subject to regional agreements.

5.1.2 It was noted that the proposed amendments included:

a) corrections to inaccuracies, current or forecast, that would exist by November 2020; and

b) provisions that were redundant in relation to ICAO global provisions.

5.1.3 The NAT SPG agreed that the work on these two groups of amendments needed to be divided, with the inaccuracies to be addressed as a matter of priority. In parallel, the Secretariat would provide further clarifications on ICAO expectations from the NAT SUPPs (Doc 7030), and if necessary, propose changes to the NAT IMG/48 principles and subsequently coordinate further amendments to the NAT SUPPs (Doc 7030), if required.

5.1.4 Based on the foregoing, the following was endorsed:

NAT SPG Conclusion 55/17 – PfA to NAT SUPPs (Doc 7030/5)

That the ICAO Regional Director, Europe and North Atlantic process the proposed amendment to the NAT *Regional Supplementary Procedures* (NAT SUPPs, Doc 7030/5) in order to:

a) publish corrections to the identified inaccuracies known and forecasted by January and November 2020, for the update of NAT SUPPs (Doc 7030/5) as provided in **Appendix N**;

b) coordinate and clarify ICAO expectations for the NAT SUPPs (Doc 7030) and if necessary, propose changes to the NAT IMG/48 principles; and

c) carry out a review of the remaining proposed changes to the NAT SUPPs (Doc 7030).

5.2 NAT GANP/ASBU 2018 IMPLEMENTATION STATUS REPORT

5.2.1 The NAT SPG was presented with the 2018 NAT GANP/ASBU (Aviation System Block Upgrades) Implementation Status Report (**Appendix O** refers).

5.2.2 It was noted that the ICAO EUR/NAT Office had prepared a short questionnaire concerning States' status of implementation of the ASBU Block 0 and Block 1 modules as well as Air Navigation Reporting Forms (ANRF) related to a number of projects being implemented in the NAT Region, which was sent to NAT IMG members and/or nominated focal points with a deadline for reply of 12 April 2019. It was noted that this document would form the basis for the NAT dashboard to monitor the status of GANP implementation.

5.2.3 Based on the foregoing, the following was endorsed:

NAT SPG Conclusion 55/18 – 2018 GANP/ASBU Implementation Status Report – NAT Region

That the ICAO Regional Director, Europe and North Atlantic, on behalf of NAT SPG, take the necessary actions to publish the endorsed *2018 GANP/ASBU Implementation Status Report – NAT Region* as provided in **Appendix O**.

5.3 NAT DOC 001 - NAT SPG HANDBOOK

5.3.1 The NAT SPG was presented with several amendments to the *North Atlantic Systems Planning Group* (NAT SPG) *Handbook* (NAT Doc 001).

a) Considering the importance that the NAT SPG placed on the need to establish a robust monitoring system for the NAT Region communications infrastructure required to sustain the reduced separation minima, update the composition of the North Atlantic Technology and Interoperability Group (NAT TIG), Section 2:D of NAT Doc 001, to include ARINC, Inmarsat, Iridium, and Sitaonair as members of the NAT TIG;

b) Update the NAT SOG Terms of Reference, Section 3:A of NAT Doc 001, in order to streamline the process for timely contributions and processing of the NAT Annual Safety Report (NAT ASR) and to provide appropriate support to this task;

c) The NAT SOG approved the North Atlantic Scrutiny Group (NAT SG) Handbook which was intended to serve as a summary reference document to describe and illustrate how the NAT SG conducted its work and how the results should be delivered to the NAT SOG. Accordingly, a modification to the NAT SG Terms of Reference, Section 3:D of NAT Doc 001, was agreed to make reference to the NAT SG Handbook.

d) A modification to the NAT CMA Terms of Reference, Section 4:A of NAT Doc 001, was agreed for the NAT CMA to provide monitoring of loss of longitudinal separation;

e) With regard to Section 5:A SAFETY RELATED POLICIES, the NAT SPG agreed that the descriptions of the safety KPIs iv) to xii) were incorrect and should read instead "Reduction over the previous rolling three-year period of performance" without the mention of "compared to 2015-2016-2017 baseline";

f) Section 5:A of NAT Doc 001 also specified two different target levels of safety (TLS) for the lateral domain: one for monitoring purposes (20x10-9) to be reported by NAT CMA to NAT SOG and NAT SPG, and one for planning purposes (5 x10-9). It was highlighted that having two values for this TLS created confusion. After review of the reasons for this difference, it was agreed to use the TLS of 5x10-9 for both monitoring and planning purposes for the lateral domain; and

g) Amend the definition of "Long Duration LHD" contained in Note 3 of NAT Doc 001, Section 5:A. The proposed definition specified that Large Height Deviation (LHD) events need to be unprotected by ATC for a period exceeding 20 minutes to qualify as a Long Duration LHD. It was also agreed that the responsibility for the reporting against the TLS to the NAT SOG and NAT SPG lay with the North Atlantic Mathematicians Working Group (NAT MWG)) and not the NAT CMA.

5.3.2 The NAT SPG was also presented with the outcome of the work performed by NAT Safety Case Components Project Team (NAT SCC PT), which had been tasked to "further define NAT safety case terminology and further develop guidance to support the development of safety cases for changes to the NAT air navigation system requiring NAT SPG approval and outlined in the *NAT SPG Handbook*".

5.3.3 The NAT SPG agreed that changes affecting the NAT Region required NAT SPG approval and that approval should be considered a regional approval based on a regional safety case. It was noted that the required level of detail of a safety case to be put forward to the NAT SOG for review was one of the issues that was repeatedly debated. With the intention to clarify the level of detail required and to provide better guidance on what is needed to successfully address each safety case component, the NAT SPG agreed to the proposed amendments to the Definitions and Components of Safety Cases in support of changes to the NAT air navigation systems requiring NAT SPG approval contained in the NAT Doc 001, Section 5:A, subsection [04] regarding the definition and components of Safety Cases as presented in **Appendix P**.

5.3.4 Additionally, the following updates to the *NAT SPG Handbook* (NAT Doc 001) were agreed:

a) update to the List of NAT SPG Representatives; and

b) updates in the Section 6:A "Documents Promulgated by the NAT SPG".

5.3.5 Also taking into account the discussions on the update of Observers of the NAT SPG in paragraph 8.1 below, the following was endorsed:

NAT SPG Conclusion 55/19 – Update of NAT SPG Handbook, NAT Doc 001, v2.4.0

That the:

a) *North Atlantic Systems Planning Group* (NAT SPG) *Handbook* (NAT Doc 001) be amended as presented at **Appendix P**; and

b) ICAO Regional Director, Europe and North Atlantic, take appropriate action to publish and promulgate the updated NAT Doc 001, v2.4.0.

5.4 NAT DOC 006 - AIR TRAFFIC MANAGEMENT OPERATIONAL CONTINGENCY PLAN - NORTH ATLANTIC REGION

5.4.1 The NAT SPG was informed about changes that would be required to the *Air Traffic Management Operational Contingency Plan - North Atlantic Region* (NAT Doc 006) as provided by France, Ireland and Portugal.

5.4.2 The following proposals to update NAT Doc 006, Part I, were agreed:

a) Chapter 4, paragraphs 4.3 and 4.6: updates to the frequencies used by Santa Maria Radio Station as well as in the surveillance area. The management of traffic in case of service interruption has also changed due to the availability of both approach sectors inside Santa Maria surveillance area that, since then, have started to provide surveillance services;

b) Chapter 7. paragraphs 7.4 and 7.5.1: Changes to contingency tracks as defined in Chapter 7.4, XETBO replaces DOLUL, NASBA replaces NERTU, Note 2 amended to include NASBA and Changes to Shannon ACC contingency route structure; and

c) Chapter 8, paragraph 8.5.1: updates to the frequencies used in the Paris ACC, Reims ACC and Bordeaux ACC leading to the change of the contingency routing chart.

5.4.3 Based on the foregoing, the following was endorsed:

NAT SPG Conclusion 55/20 – PfA to NAT Doc 006, Part I, v1.12

That, the ICAO Regional Director, Europe and North Atlantic, take appropriate action to publish the amendment to the *Air Traffic Management Operational Contingency Plan -North Atlantic Region* (NAT Doc 006, Part I, v1.12), Chapters 4, 7 and 8, as detailed in **Appendix Q.**

5.5 NAT DOC 007 - NAT OPERATIONS AND AIRSPACE MANUAL

5.5.1 The NAT SPG reviewed the following proposed amendments to the *North Atlantic Operations and Airspace Manual* (NAT Doc 007) and a NAT OPS Bulletin related to PBCS Operation:

a) Inclusion of a link to the NAT OPS Bulletin on Data Link Performance Improvement Options (Serial no: 2019_003);

b) amendment to the Strategic Lateral Offset Procedures (SLOP) provisions which took account of the use of 0.1 NM SLOP to the right of centerline up to 2 NM whilst being aligned with the current ICAO provisions; and

c) deletion of “Aberdeen ATSU”(Air Traffic Service Unit) from paragraph 17.3.2.

5.5.2 In view of the above, the following was endorsed:

NAT SPG Conclusion 55/21 – PfAs to NAT Doc 007, v.2019_3

That, the ICAO Regional Director, Europe and North Atlantic, take appropriate action to publish the NAT SPG-endorsed amendments to the *North Atlantic Operations and Airspace Manual* (NAT Doc 007) as detailed in **Appendix R**.

5.5.3 In addition, the NAT SPG also endorsed the following:

NAT SPG Conclusion 55/22 – NAT OPS Bulletin on Data Link Performance Improvement Options

That, the ICAO Regional Director, Europe and North Atlantic, take appropriate action to publish the NAT OPS Bulletin on data link performance improvement options (Serial no: 2019_003) as provided in **Appendix S**.

5.6 NAT DOC 010 - CONSOLIDATED REPORTING RESPONSIBILITIES HANDBOOK – NORTH ATLANTIC REGION

5.6.1 The NAT SPG was presented with updates to the *Consolidated Reporting Responsibilities Handbook – North Atlantic Region* (NAT Doc 010):

a) updates to the “Traffic Activity Data” section;

b) deletion of section related to Traffic Count. It was noted that the NAT MWG obtained flight counts from the Traffic Activity Data detailed above, as well as flight hours for OTS and Random traffic across the different Oceanic Control Areas and therefore the “Traffic Count” section was no longer required; and

c) deletion of the Implementation of New Mitigations and the Occurrence Classification Codes section and the updates of Region-Specific Reporting Responsibilities.

5.6.2 It was also noted that the Occurrence Classification Codes, which no longer met monitoring requirements, were replaced with Causal, Mitigation, Operator Response and Human Factors values in the NAT SG Handbook. The meeting also agreed that the following amendments be made to the proposed draft:

a) The foreword be amended to remove the reference to a relationship between the DLMA and CMA since no such relationship currently existed;

b) That a reference to the NAT SG Handbook to the place where reportable events are defined be added to section 2 of the document; and

c) That a Note be added to the section that specifies reports to the DLMA to advise readers that in some cases, a report may be required (depending on the nature of the event) to both the DLMA and CMA.

5.6.3 Based on the foregoing, the following was endorsed:

NAT SPG Conclusion 55/23 - Update of Consolidated Reporting Responsibilities Handbook – North Atlantic Region, (NAT Doc 010)

That the ICAO Regional Director, Europe and North Atlantic, take appropriate action to publish the NAT SPG-endorsed *Consolidated Reporting Responsibilities Handbook – North Atlantic Region* (NAT Doc 010) (**Appendix T** refers).

6. WORK PROGRAMME INCLUDING SUB-GROUPS

6.1 NAT 2030 VISION

6.1.1 The NAT SPG was informed that in follow up to NAT SPG Conclusion 54/22, the NAT 2030 Vision Workshop was held at the ICAO EUR/NAT Office in Paris, France from 29 to 30 January 2019. The workshop was attended by more than 120 representatives from twelve (12) States and eleven (11) Organizations/Industries. The workshop discussed several issues related to the North Atlantic Region, current/future developments and a way forward towards the 2030 vision.

6.1.2 The workshop recommended an initial set of NAT 2030 Vision principles, goals and objectives, and a list of potential improvements.

6.1.3 After reviewing these recommendations, the following action was endorsed:

NAT SPG Conclusion 55/24 – NAT 2030 Vision high-level principles, goals and objectives and potential improvement areas

That, the NAT SPG:

a) endorse the initial NAT 2030 Vision high-level principles, goals and objectives, and the list of potential improvement areas in **Appendix U**; and

b) task the NAT IMG, in coordination with NAT SOG and NAT EFFG as required:

i) to further refine the NAT 2030 Vision high-level principles and list of potential improvements in order to prioritise them by their practical implementation feasibility by 2030; and

ii) to update the relevant NAT documentation (i.e. *Future ATM Concept of Operations for the North Atlantic Region* (NAT Doc 005) and the NAT Service Development Roadmap as contained in the *Air Navigation Plan – North Atlantic Region* (NAT eANP, Vol III, Doc 9634) and work programmes in accordance with the endorsed NAT 2030 Vision high-level principles, goals and objectives.

6.2 REPORT OF THE NAT IMG

6.2.1 The NAT SPG was informed that the NAT IMG Chairman, Mr Alastair Muir, was planning to step down by the end of 2019. While disappointed to hear of his decision, the NAT SPG expressed its appreciation for the exceptional leadership exhibited throughout his tenure, particularly when considering the successful initiatives implemented within the NAT Region during that time. It was agreed that the elections of the new Chairperson and Vice-Chairperson for NAT IMG would take place at the NAT IMG/55 meeting.

6.2.2 The NAT SPG noted that the NAT IMG/55 meeting would take place from 4 to 8 November 2019 in New York, United States. NAT IMG/56 was planned to be held from 27 April to 1 May 2020 at the ICAO EUR/NAT Office and NAT IMG/57 would be hosted by Ireland in Shannon in autumn 2020.

6.3 REPORT OF THE NAT EFFG

6.3.1 It was noted that the NAT EFFG was continuing its work to develop a methodology to determine when a formal business case analysis (BCA) and/or other financial assessment tools must be completed for the NAT SPG to be aligned with ICAO guidance from the GANP.

6.3.2 The NAT SPG was informed that following the NAT SPG/54 discussions concerning the traffic forecast methodology, a NAT EFFG project team was established to review and verify the methodology and data used to prepare the NAT Traffic Forecast. The project team was expected to complete the following tasks by the end of 2019.

6.3.3 The NAT SPG was informed that Ms. Thea Graham (United States), Chairperson of the NAT EFFG, was retiring in June 2019. The elections of a new Chairperson would take place at the next NAT EFFG meeting from 26 to 28 November 2019 and the NAT States had been invited to submit their nominations before 26 September 2019 (EUR/NAT 19-0227.TEC (POS/BRM) dated 4 June 2019 refers).

6.4 REPORT OF THE NAT SOG

6.4.1 It was noted that the NAT SOG/21 would be held in Madrid, Spain from 10 to 13 December 2019. The NAT SOG/22 would be held from 1 to 5 June 2020 in the ICAO EUR/NAT Regional Office in Paris, France.

6.5 NAT PROJECT TEAMS STATUS

6.5.1 The NAT SPG noted the status of the ongoing NAT SPG, NAT IMG and NAT SOG project teams (**Appendix V** refers).

7. ELECTION OF CHAIRPERSON

7.1 NAT SPG HONORARY CHAIRMAN

7.1.1 The NAT SPG expressed their great appreciation of Mr Ásgeir Pálsson, the outgoing Chairman, who was stepping down as Chairman of the NAT SPG. The NAT SPG would greatly miss his presence, his depth of knowledge and experience. In expressing their appreciation of his thorough professionalism and good humour, the NAT SPG wished him all the best and happiness in his future endeavours. Additionally, the following was agreed:

NAT SPG Conclusion 55/25 – NAT SPG Honorary Chairman

> That, the NAT SPG, in recognition of Mr Ásgeir Pálsson's achievements as NAT SPG Chairman from 1996 to 2019, confer him with the title of "NAT SPG Honorary Chairman".

7.2 ELECTIONS OF NEW CHAIRPERSON

7.2.1 The NAT SPG proceeded with the elections of a new Chairperson. It was noted that in line with the established procedures, States had been invited to submit nominations for this position by 17 April 2019 and the following nominations had been received:

a) Mr. Jeff Dawson, Director of Standards, Procedures and International Coordination, NAV CANADA – nominated by Canada– seconded by United Kingdom; and

b) Ms. Hlin Holm, Head of Air Navigation Services Section, Icelandic Transport Authority – nominated by Iceland – seconded by Norway.

7.2.2 Following the election procedure, the NAT SPG elected Ms. Hlin Holm as NAT SPG Chairperson. The NAT SPG congratulated Hlin and wished her success in her new role as Chairperson.

8. ANY OTHER BUSINESS

8.1 REQUESTS FOR OBSERVER STATUS IN NAT SPG

8.1.1 The NAT SPG was presented with the requests from Trinidad and Tobago, EUROCONTROL and the International Federation of Airline Dispatchers Associations (IFALDA) to participate as observers in meetings of the NAT SPG and its Contributory Groups.

8.1.2 In this regard, it was noted that the ICAO Council recognized EUROCONTROL and the International Federation of Airline Dispatchers Associations (IFALDA) as Organizations that may be invited to suitable meetings of ICAO.

8.1.3 The NAT SPG welcomed all three requests for observer status at the NAT SPG. It was highlighted that their participation would be beneficial for the NAT Region activities, especially from the perspective of the NAT and EUR/South American (SAM)/SAT harmonisation and coordination. The participation of IFALDA would be important to ensure a close link with the airline dispatchers' community. With respect to the NAT IMG and NAT SOG, it was noted that the composition would remain as it was currently constituted to ensure commitment of resources to the NAT implementation programme.

8.1.4 With respect to the experts' level groups, the NAT SPG agreed that IFALDA's participation at the NAT SG, NAT POG and NAT TIG and EUROCONTROL's participation at the NAT POG and NAT TIG as observers would be supported.

8.1.5 Therefore, it was agreed that the Secretariat would amend NAT Doc 001 accordingly (paragraph 5.3.1 and NAT SPG Conclusion 55/19 refer).

8.2 ICAO EUR/NAT ACTIVITIES ON ENVIRONMENT

8.2.1 The NAT SPG was presented with the latest updates on the ICAO environmental activities in the EUR/NAT regions related to States' Action Plan Initiatives and Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) as well as potential new environmental capacity building activities to further support States.

8.2.2 In this regard, NAT SPG members were invited to:

a) continue the efforts in the framework or in coordination with the EUR Environment Task Force to provide capacity-building activities for environment related matters;

b) contact ICAO as soon as possible if they had not received their password and username to access the online database CORSIA Central Registry;

c) provide to ICAO the list of aircraft operators attributed to them and the list of accredited verification bodies if they had not done so yet;

d) develop or update their quantified States' Action Plans on CO_2 Emissions Reduction Activities in accordance with the provisions in the *Guidance on the Development of States' Action Plans on* CO_2 *Emissions Reduction Activities* (Doc 9988) and submit them to ICAO as soon as possible; and

e) identify their needs for environment-related capacity building activities and contact the ICAO EUR/NAT Office.

8.3 NEXT MEETING

8.3.1 It was agreed that NAT SPG/56 would be convened at the EUR/NAT Office of ICAO in Paris, France, from 22 to 25 June 2020.

APPENDIX A — LIST OF PARTICIPANTS

(Paragraph 0.3 refers)

CANADA
Jeff DAWSON
Jean-Pierre CÔTÉ
Dave SHEPPARD
Noel DWYER

DENMARK
Anna Eva VILLEFRANCE

FRANCE
Christophe GUILPAIN

ICELAND
Ásgeir PÁLSSON (NAT SPG Chairman)
Hlin HOLM
Thordis SIGURDARDOTTIR
Bjarni STEFANSSON

IRELAND
Billy HANN
Sean PATRICK
Paul KENNEDY
John O'SULLIVAN

NORWAY
Roald LARSEN

PORTUGAL
Antonio RITA
Carlos ALVES

UNITED KINGDOM
Stuart LINDSEY
Jean-Francois SOLDANO
Martin DONNAN

UNITED STATES
Juan FUENTES
Kevin HAGGERTY
Travis FIEBELKORN
Darryel D. ADAMS
Jennifer KILEO

EUROCONTROL
Rob PETERS

International Air Transport Association (IATA)
Jeffrey MILLER
Rich STARK

International Federation of Airline Dispatchers Associations (IFALDA)
Sergey VAKHRUSHEV

International Federation of Air Line Pilots Association (IFALPA)
Carlos RODRIGUEZ

International Federation of Air Traffic Controllers' Association (IFATCA)
Apologies

INMARSAT INC
Lisa BEE

NAT Central Monitoring Agency (NAT CMA)
Carolyn READ

ICAO HEADQUARTERS
Stephen CREAMER
Herman PRETORIUS

ICAO EUR/NAT
Silvia GEHRER (NAT SPG Secretary)
Elkhan NAHMADOV
Abbas NIKNEJAD
Arnaud DESJARDIN
Blandine FERRIER
Christopher KEOHAN
Cornelia LUDORF
Sarantis POULIMENAKOS
Sven HALLE
Oguzhan HASDENIZ
Leyla SULEYMANOVA
Mihaela BRUNETTE
Patricia CUFF

Participants and Members Contact List

(Paragraph 0.3 refers)

To be included only on Restricted Website of NAT SPG

APPENDIX B — LIST OF MEETING DOCUMENTATION

(paragraph 0.3 refers)

WP / IP# FL /PPT	***Ag item***	***Title***	***Presented by***
WP01 REV	0	Draft Agenda	Secretariat
WP02 REV02	1	Status of NAT SPG Conclusions	Secretariat
WP03	1	NAT 2030 vision	Secretariat
WP04	2	Data Link availability	Secretariat
WP05	2	PBCS non compliance	Secretariat
WP06	2	PBCS requirements and vertical limit for DLM Phase 2C	Secretariat
WP07	2	NAT ASEPS Operational Trial Using ADS-B	Secretariat
WP08	2	AIREON Alert	Secretariat
WP09 REV	2	Operations Without an Assigned Fixed Speed (OWAFS)	Secretariat
WP10	5	Updates to NAT SUPPs (Doc 7030)	Secretariat
WP11 REV	5	Updates to NAT Doc 007 and NAT Doc 006	Secretariat
WP12	5	2018 GANP/ASBU Implementation Status Report	Secretariat
WP13	8	Updates to NAT SPG Handbook (NAT Doc 001)	Secretariat
WP14 REV	8	EUROCONTROL, IFALDA and Trinidad and Tobago - Observer Status in NAT SPG and Working Groups Meetings	Secretariat
WP15	1	Outcomes of the first Atlantic Coordination Meeting	Secretariat
WP16	2	Uplink Latency Timer (ULT) and RCP 240 mandate	Secretariat
WP17	4	Outcomes of the NAT EFFG/35 and NAT EFFG/36	Secretariat
WP18	3	NAT Annual Safety Report (ASR) 2018	Secretariat
WP19	5	Updates to NAT Doc 010	Secretariat
IP01 REV	0	Meeting schedule	Secretariat
IP02 REV02	0	Meeting documentation	Secretariat
IP03	1	ICAO Update	Secretariat
IP04	1	Status of NAT Project Teams	Secretariat
IP05	1	ICAO Business Plan 2020-2022	Secretariat
IP06 REV	1	Update On The Progress In Cybersecurity	Secretariat
IP07	2	Outcomes of NAT IMG/53 & 54	Secretariat
IP08	3	Volcanic Ash Activities	Secretariat
IP09	5	Data Link performance report 2018	Secretariat
IP10	2	South East Corner Updates	Secretariat
IP11	5	Radio Stations Network Report 2018	Secretariat
IP12	2	Satellite Communications Service Availability Considerations	Inmarsat

WP / IP# FL /PPT	*Ag item*	*Title*	*Presented by*
IP13	1	ICAO Environmental Activities	Secretariat
PP01	2	AIREON Alert	Ireland
FL01	7	Election of Chairperson Procedure	Secretariat
FL02	5	In support of WP/11 Additional updates to NAT Doc 006	France
FL03	6	In support of WP/03 Outcome of NAT 2030 Vision Workshop	Secretariat
FL04	2	In support of WP/05 PBCS Non-compliance Reports	Secretariat
FL05	2	In support of WP/16 ULT PT and RCP 240 Mandate	NAT SOG Chair

APPENDIX C — STATUS OF NAT SPG CONCLUSIONS

(paragraph 1.3.1 refers)

STATUS OF NAT SPG/54 CONCLUSIONS

No.	Title of Conclusion	Desciption	Remarks	Status
C 54/16	PfA to NAT SUPPs, concerning Implementation Plans for Application of 42.6 km (23 NM) Lateral Separation minimum and for Application of 5 minute Longitudinal Separation minimum between PBCS compliant ADS-C equipped aircraft in the Santa Maria Oceanic FIR	That the ICAO Regional Director, Europe and North Atlantic, process the proposed amendment to the NAT Regional Supplementary Procedures (NAT SUPPs, Doc 7030/5) as provided in Appendix M in accordance with the formal procedures.	IOM EUR/NAT 18-0376.TEC of 1 August 2018 sent to HQ. SL EUR/NAT 19-0240.TEC of 11 June 2019 was circulated with deadline for replies on 11 July 2019.	On-going
C 54/23	Incorporation of Cybersecurity into NAT Planning	That, the NAT SOG and NAT IMG undertake a review of the ICAO EUR/NAT GASeP implementation Roadmap to propose NAT Region coordinated follow up actions related to cybersecurity.		On-going

APPENDIX D — STANDARD FORMAT FOR MONTHLY PBCS REPORTS TO NAT CMA

(*paragraph 2.2.6 refers*)

PBCS ANSP NON-COMPLIANCE REPORT FORM

Report date	Enter the date the report is being sent to the NATCMA
Period of observed non-compliance	Enter the period of concern
Reporting air navigation service provider (ANSP)	Enter ANSP (e.g. NATS/NAV Canada/FAA/ISAVIA/Nav Portugal)
Reporting to regional monitoring agency (RMA)	Enter RMA (NATCMA)
Operator	Enter operator information (e.g. ICAO Operator code or Operator Name)
ICAO Aircraft Type	Enter ICAO aircraft type
Airframe (s) (if applicable)	Enter airframe (s) if applicable
Was P2 filed in item 10 during this period? (Y/N)	Enter Y or N
Was RSP 180 filed in item 18 SUR/ during this period? (Y/N)	Enter Y or N
ANSP notes	Provide any relevant notes on the observed non-compliance including specific problems noted in the data or experienced by ATC, and any performance history

SUPPORTING INFORMATION:
Suggestions: monitoring results for the concerned fleet or airframe from regional reports provided on the FANS-CRA website, table or chart with monthly results for a sudden degradation, data excerpts in PBCS format.

Regional Monitoring Results from FANS-CRA website:

PBCS Monitoring Report

Period: July to December 2017

Color Key:

	Meets criteria
	Accepted but below criteria
	Under criteria

State of Registry	Data Source (FIR)	Operator/Aircraft Type	ADS-C downlink Message Counts	95% RSP 180 benchmark ASP <=90 sec	99.9% RSP 180 benchmark ASP <= 180 sec	CPDLC Transaction Counts (WILCO Received)	95% RCP 240 benchmark ACP <= 180 sec	99.9% RCP 240 benchmark ACP <=210 sec
Fleet Performance								
Individual airframe performance								

Monthly results from ANSP X:

Time period	OP Code	ADS-C [RSP 180]				CPDLC [RCP 240]						
		Count of ADS-C	% of Total ADS-C	ASP		Count of CPDLC	% of Total CPDLC	ACTP		ACP		PORT
				95% (90sec)	99.9% (180sec)			95% (120sec)	99.9% (150sec)	95% (180sec)	99.9% (210sec)	95% (60sec)
Jan-18	XXX	2,810	0.7%	98.5%	99.4%	32	0.4%	100.0%	100.0%	100.0%	100.0%	100.0%
Feb-18	XXX	2,461	0.7%	98.7%	99.6%	33	0.5%	100.0%	100.0%	100.0%	100.0%	100.0%
Mar-18	XXX	2,881	0.7%	99.2%	99.7%	48	0.6%	100.0%	100.0%	100.0%	100.0%	100.0%
Apr-18	XXX	2,760	0.7%	99.0%	99.7%	52	0.6%	100.0%	100.0%	100.0%	100.0%	100.0%
May-18	XXX	2,960	0.7%	99.1%	99.6%	52	0.5%	100.0%	100.0%	100.0%	100.0%	100.0%
Jun-18	XXX	2,284	0.5%	90.3%	92.6%	42	0.4%	97.6%	97.6%	97.6%	97.6%	100.0%
Jul-18	XXX	2,295	0.4%	83.0%	87.2%	36	0.3%	97.2%	97.2%	97.2%	97.2%	100.0%

Data excerpt: (highlighting significant use of HFDL media as likely problem)

FIR	Airframe	ICAO ACT	ICAO Oper	Date	Path ID	Msg Typ	Lat	Long	Position time	Recpt time	Delay (sec)	Media
ZZZ	XX1234	B788	XXX	20180703	H05	PER	26.5103	-120.653	10:08:26	10:08:50	24	HF
ZZZ	XX1234	B788	XXX	20180703	H05	PER	27.3283	-121.721	10:18:02	10:19:40	98	HF
ZZZ	XX1234	B788	XXX	20180703	H05	PER	28.1425	-122.811	10:27:38	10:28:52	74	HF
ZZZ	XX1234	B788	XXX	20180703	H05	PER	28.9553	-123.927	10:37:14	10:42:12	298	HF
ZZZ	XX1234	B788	XXX	20180703	XXW	PER	29.3183	-124.436	10:41:33	10:48:26	413	SAT
ZZZ	XX1234	B788	XXX	20180703	XXW	PER	29.7653	-125.071	10:46:50	10:48:55	125	SAT
ZZZ	XX1234	B788	XXX	20180703	H02	PER	30.5661	-126.234	10:56:26	11:01:21	295	HF

APPENDIX E — PFA TO NAT DOC 007, V.2019_3 RELATED TO UPPER LIMIT FOR NAT DLM PHASE 2C

(*paragraph 2.4.3 refers*)

NAT DOC 007 page 170

ATTACHMENT 10

CHECKLIST FOR DISPATCHERS

. . .

Recall Item	Check	Timelines	Reference	
. . .				
Datalink Mandate Compliance	» Phase **2A**, commenced 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**, commenced~~ig~~ 7 December 2017: FL 350 to FL 390 (inclusive) throughout the ICAO NAT region; » Phase **2C**, commencing 30 January 2020: FL 290 ~~and above~~ to FL 410 (inclusive) throughout the ICAO NAT Region.			

APPENDIX F — AMENDMENTS TO NAT OPS BULLETIN 2017_001 ADDRESSING THE VERTICAL DIMENSION OF NAT DLM PHASE 2C

(*paragraph 2.4.3 refers*)

NAT OPS BULLETIN

Serial Number: **2017_001**_Revision ~~03~~04[1]	**Issued: TBD**
Subject: NAT common DLM AIC	**Effective: TBD**
Originator: NAT SPG	

The purpose of North Atlantic Operations Bulletin 2017_001_Revision ~~03~~04 is to provide guidance to North Atlantic (NAT) operators to prepare them for Phase 2C~~2B~~ of the North Atlantic Data Link Mandate (NAT DLM).

Any queries about the content of the attached document should be addressed to**: ICAO EUR/NAT Office: **icaoeurnat@paris.icao.int

[1] *This NAT OPS Bulletin supersedes Serial Number: 2017_001_Revision ~~02~~03.*

*The NAT OPS Bulletin Checklist is available at **www.icao.int/EURNAT/EUR & NAT Documents**, **NAT Documents**, then **NAT Ops Bulletins**.*

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 on 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.

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

Purpose of Circular

This common NAT 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-TBO. 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) 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, commenced 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, commenced 7 December 2017: FL 350 to FL 390 (inclusive) throughout the ICAO NAT region;

- Phase 2C, commencing 30 January 2020: FL 290 ~~and above~~ to FL 410 (inclusive) 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 East flight information region (FIR);

- Airspace where an ATS surveillance service is provided by means of radar, multilateration and/or ADS-B, coupled with VHF voice communications as depicted in State Aeronautical Information Publications (AIP), provided the aircraft is suitably equipped (transponder/ADS-B extended squitter transmitter);

- Specific areas as agreed through the NAT SPG and specified below:

a) the implementation of the NAT DLM Phase 2B goes ahead on 7 December 2017 except for non-DLM equipped aircraft that are allowed to operate on:

   i. T9 and T213 until solutions to provide ATS surveillance and VHF services (eventually moving T213 to the east in order to be fully covered) are implemented, after which time the NAT DLM would no longer be applicable in this airspace. This implementation will be achieved as early as possible but no later than 30 January 2020; and

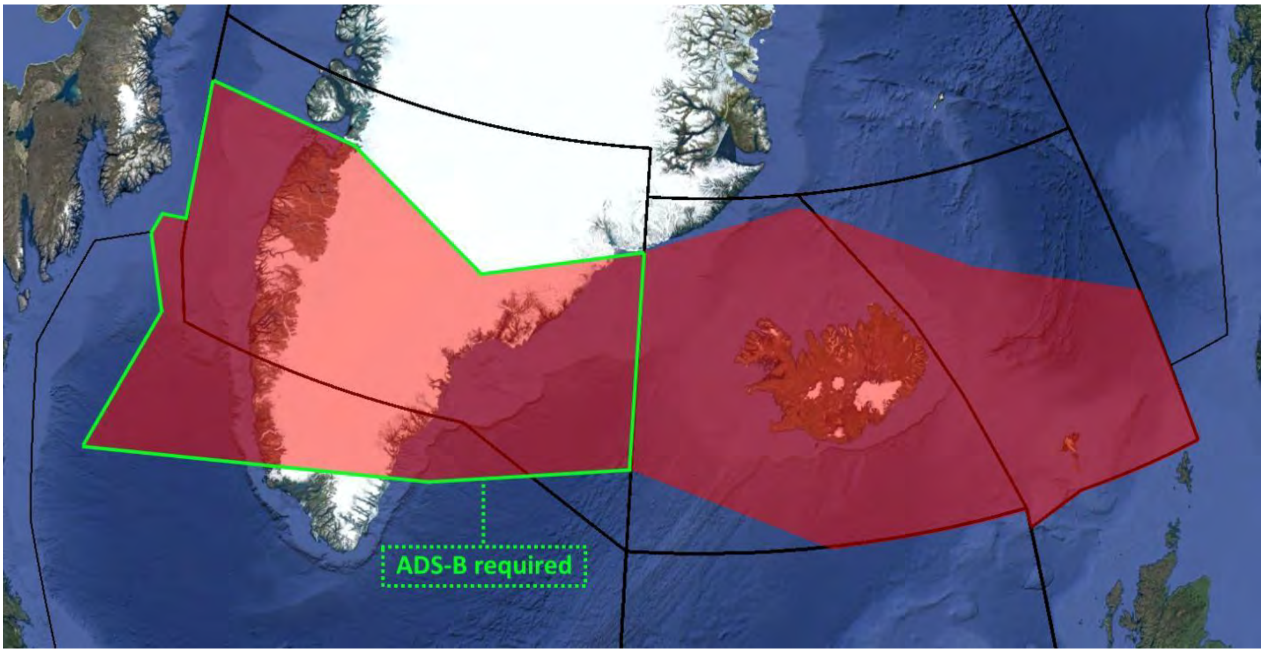
   ii. T13, re-aligned T16 and T25 until 30 January 2020

b) there will be no other changes to the applicability of Phase 2B and that the date of implementation of Phase 2C remains on 30 January 2020.

   Note 1: the aircraft operators using Tango routes within the NAT DLM area of applicability will either complete their fleet upgrades by January 2020 or will not be allowed to operate in that volume of airspace.

   Note 2: Whenever an Organised Track infringes Tango Route(s), the North Atlantic Data Link Mandate applies within the level band FL 350 to FL 390 inclusive, for that portion of the route infringed, during the Organised Track System times (i.e. 0100z to 0800z and 1130z to 1900z). This procedure, applied during the NAT DLM Phase 2A, will remain in force during the NAT DLM Phase 2B.

CHART 1. GUIDANCE FOR TRANS-ATLANTIC FLIGHT PLANNING BY NON-DATALINK AIRCRAFT



For planning purposes, this area is bounded by the following:

> **Northern boundary:** 65N000W - 67N010W - 69N020W - 68N030W - 67N040W - 69N050W - 69N060W - BOPUT.
> **Southern boundary:** GUNPA (61N000W) - 61N007W - 6040N010W - RATSU (61N010W) - 61N020W - 63N030W - 62N040W - 61N050W – SAVRY

Aircraft not equipped with FANS 1/A (or equivalent) systems will be allowed to operate within this area at DLM designated flight levels, provided the aircraft is suitably equipped (transponder/ADS-B extended squitter transmitter).

CHART 2. ESTIMATED EXTENT OF ATS SURVEILLANCE AIRSPACE IN THE NAT REGION

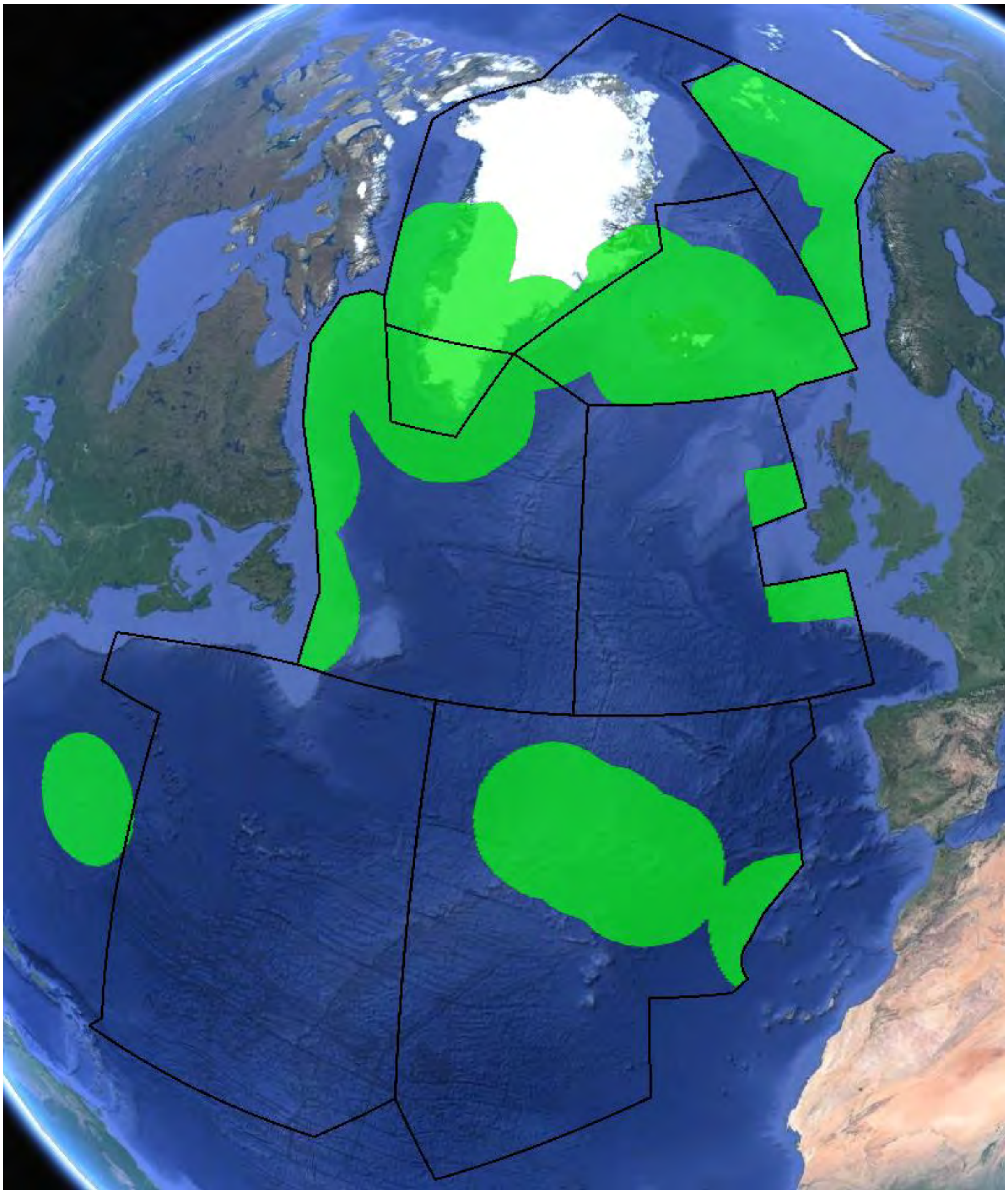
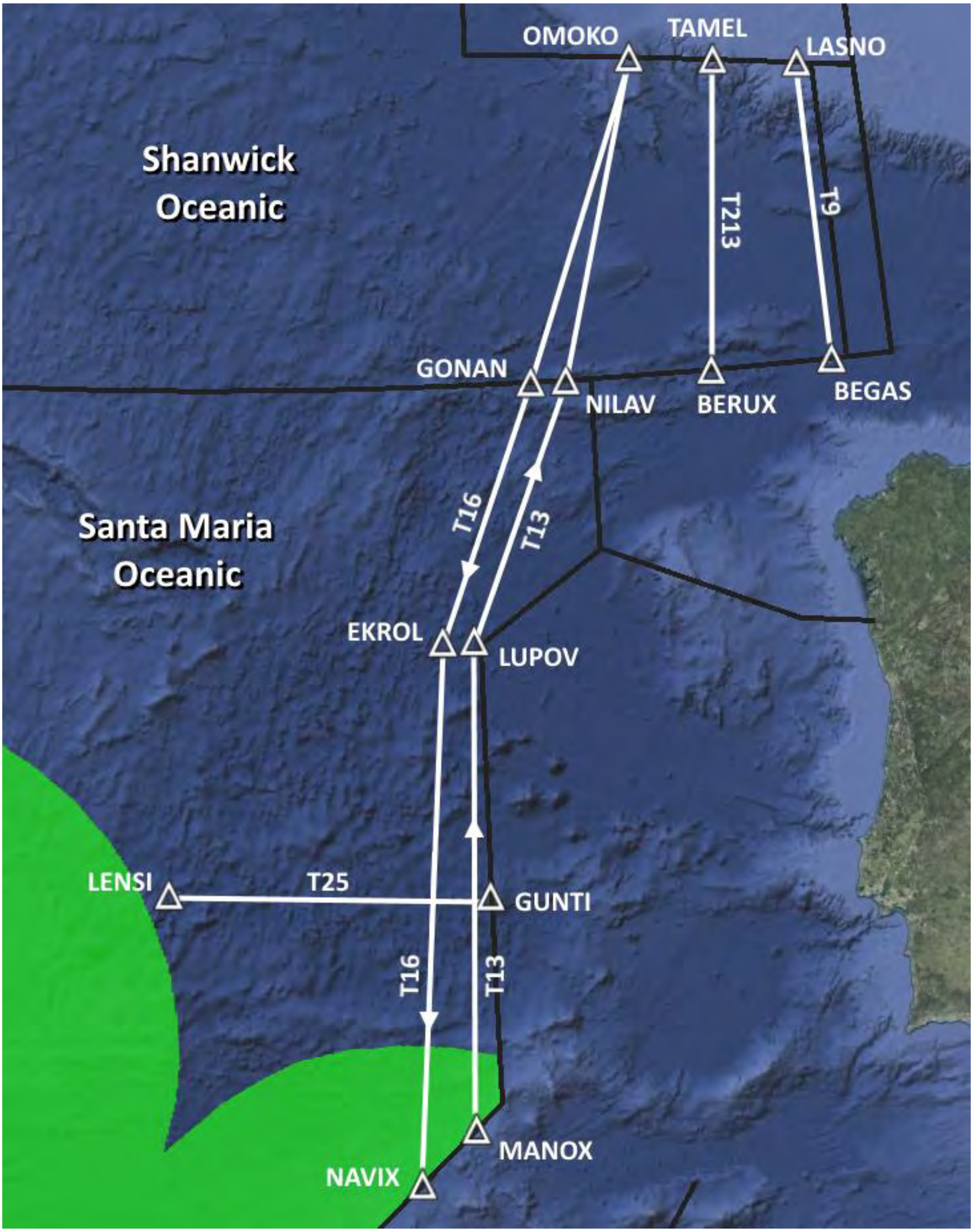


CHART 3. TANGO ROUTES IN THE NAT AIRSPACE WHERE DLM PHASE 2B WAS POSTPONED UNTIL 30 JANUARY 2020



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. Such requests, as outlined below, will be considered on a tactical basis. ~~This provision will not be applicable after commencement of Phase 2C.~~

- 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 icaoeurnat@paris.icao.int and consult AIPs of NAT provider-States.

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

(*paragraph 2.7.8 refers*)

1. INTRODUCTION

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

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

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

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

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

Table 1

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

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

2. IMPLEMENTATION PROCESS

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

Table 2

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

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

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

3. IDENTIFICATION OF THE NEED FOR CHANGE

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

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

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

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

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

4.1 *Airspace Structure*

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

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

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

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

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

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

4.2 *Strategic Lateral Offset Procedure (SLOP)*

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

4.3 *Airborne Collision Avoidance System (ACAS)*

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

4.4 *Navigation Performance Specifications*

4.4.1 The NAT High Level Airspace (HLA) is established between FL 285 and FL 420. To ensure the safe application of separation between aircraft in the NAT HLA airspace, aircraft normally need to have a MNPS approval or a NAT HLA MNPS approval to operate within this part of the NAT airspace. An exception to this is that non-approved aircraft are allowed to enter the NAT HLA airspace if the following conditions are satisfied:

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

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

4.5 *ATM Systems*

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

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

5. TRAFFIC PATTERNS & PROCEDURAL SEPARATION MINIMA

5.1 *General*

5.1.1 The traffic is dominated by two major axes. First, there is the axis linking Europe (and the Middle East) to North America (excluding Alaska). Second is the axis linking Europe to the Caribbean, Canaries, and South America. A substantial proportion of NAT traffic, namely that operating between cities in Europe and those in North America operate on the first axis.

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

5.2 *North Atlantic Organised Track System (NAT OTS)*

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

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

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

5.3 *Separation*

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

5.3.2 Longitudinal Separation

5.3.2.1 Same Direction up to 90 degrees:

- 10 minutes using Mach Number Technique (MNT);
- 5 to 9 minutes using MNT with speed differential;
- 5 minutes between RCP 240/RSP 180 compliant aircraft;
- 15, or 10 minutes between flights intersecting routes, depending on aircraft equipage;

- 50 NM RNP 10 (ADS-C periodic contract rate of 27 minutes) and RCP 240/RSP 180 compliant aircraft;
- 50 NM RNP 4 (ADS-C periodic contract rate of 32 minutes) and RCP 240/RSP 180 compliant aircraft;
- 30 NM RNP 2/4/10 (ADS-C periodic contract rate of 12 minutes) and RCP 240/RSP 180 compliant aircraft.

5.3.2.2 Opposite Direction Separation:

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

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

5.3.3 Lateral Separation

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

- 60 NM or 1 degree. 'Gentle Slope Rules' have been adopted to ensure that the actual separation never falls below distances which vary with latitude but never fall short of 50.5 NM.
- 50 NM between RNP10.
- 23 NM between RNP4 and RCP 240/RSP 180 compliant aircraft.

5.3.4 Reduced Vertical Separation Minimum (RVSM)

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

6. COMMUNICATION, NAVIGATION, SURVEILLANCE

6.1 *Communication*

6.1.1 Air / Ground Communication

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

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

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

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

6.1.2 Ground / Ground Communication

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

6.2 *Navigation*

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

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

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

6.3 *Surveillance*

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

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

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

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

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

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

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

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

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

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

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

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

7. DETERMINATION OF PROPOSED SYSTEM

7.1 *General*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Lateral Separation

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

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

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

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

b) The communication system shall satisfy RCP 240; and

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

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

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

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

In-Flight Contingency and Weather Deviation Procedures

7.2.4 Coincident with the separations listed above, the SASP has proposed changes to ICAO Doc 4444 Contingency Procedures.

7.2.5 The procedures are indicated below, with Doc 4444 section and paragraph numbering retained, and will be implemented coincident with ASEPS. The paragraph

15.2 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES IN OCEANIC AIRSPACE

15.2.1 Introduction

15.2.1.1 Although all possible contingencies cannot be covered, the procedures in 15.2.2, 15.2.3 and 15.2.4 provide for the more frequent cases such as:

a) the inability to comply with assigned clearance due to meteorological conditions, (15.2.4 refers);
b) en-route diversion across the prevailing traffic flow (for example, due to medical emergencies (15.2.2. and 15.2.3 refer)); and
c) the loss of, or significant reduction in, the required navigation capability when operating in an airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations, or pressurization failure (15.2.2. and 15.2.3 refer).

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

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

15.2.2 General procedures

Note.— Figure 15-1 provides an aid for understanding and applying the contingency procedures contained in Sections 15.2.2 and 15.2.3.

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

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

a) leave the cleared route or track by initially turning at least 30 degrees to the right or to the left, in order to intercept and maintain a parallel, direction track or route offset 5.0 NM (9.3 km). The direction of the turn should be based on one or more of the:
    1) aircraft position relative to any organized track or route system;
    2) the direction of flights and flight levels allocated on adjacent tracks;
    3) the direction to an alternate airport;
    4) any strategic lateral offset being flown; and
    5) terrain clearance;

b) the aircraft should be flown at a flight level and an offset track where other aircraft are less likely to be encountered;
c) maintain a watch for conflicting traffic both visually and by reference to ACAS (if equipped), leaving ACAS in RA mode at all times, unless aircraft operating limitations dictate otherwise;
d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);
e) keep the SSR transponder on at all times and, when able, squawk 7700, as appropriate;
f) as soon as practicable, the pilot shall advise air traffic control of any deviation from their assigned clearance;

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

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

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

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

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

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

15.2.3 Actions to be taken once offset from track

Note. — The pilot's judgement of the situation and the need to ensure the safety of the aircraft will determine whether the actions outlined in 15.2.3.2 a) or b), will be taken. Factors for the pilot to consider when diverting from the cleared route or track without an ATC clearance include, but are not limited to:

a) operation within a parallel track system;

b the potential for user preferred routes (UPRs) parallel to the aircraft's track or route;

c) the nature of the contingency (e.g. aircraft system malfunction); and

d) weather factors (e.g. convective weather at lower flight levels).

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

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

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

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

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

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

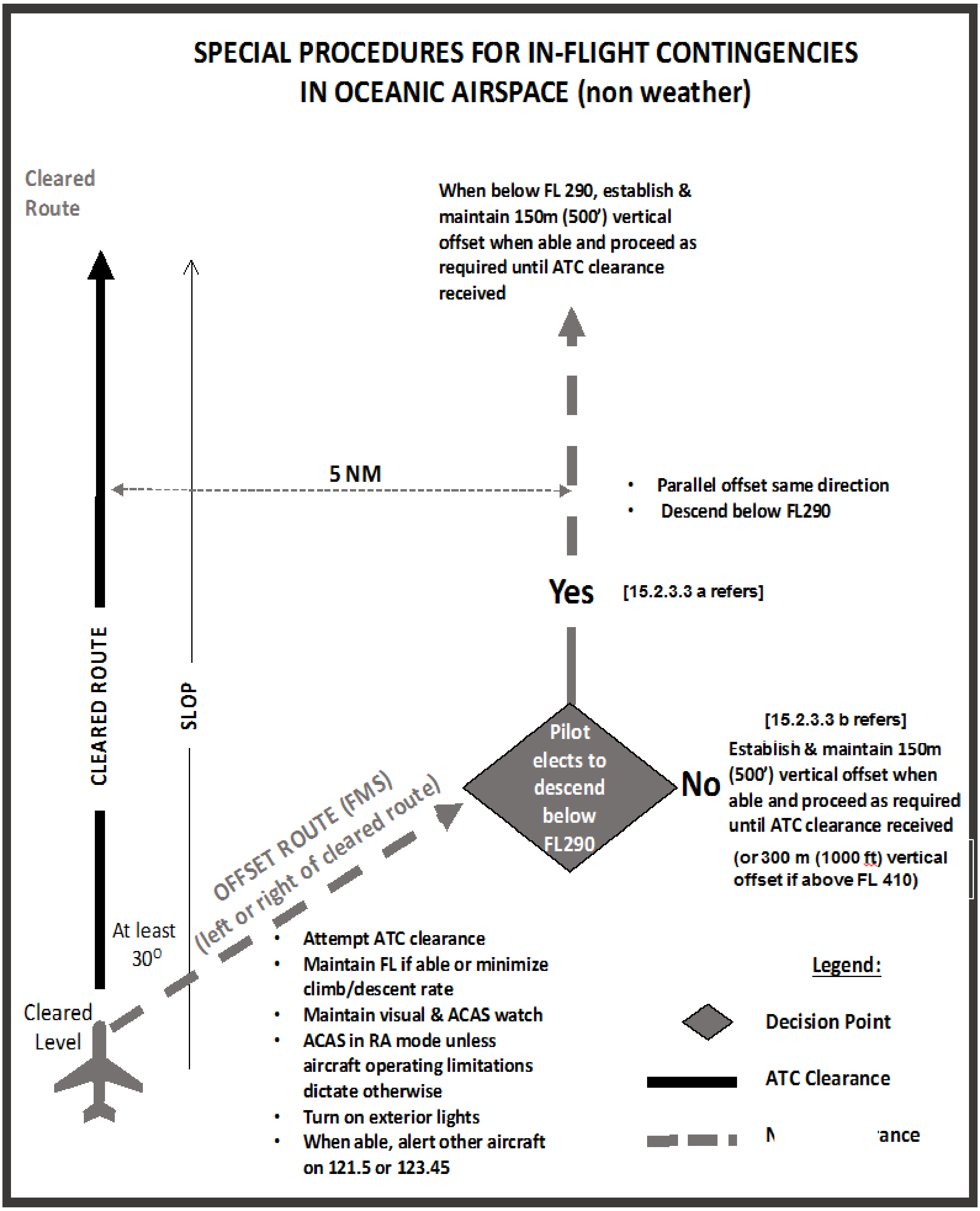


Figure 15-1. Visual aid for contingency procedures guidance

15.2.4 Weather deviation procedures

15.2.4.1 GENERAL

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

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

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

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

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

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

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

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

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

15.2.4.2.2 ATC should take one of the following actions:

a) when appropriate separation can be applied, issue clearance to deviate from track; or
b) if there is conflicting traffic and ATC is unable to establish appropriate separation, ATC shall:
   1) advise the pilot of inability to issue clearance for the requested deviation;
   2) advise the pilot of conflicting traffic; and
   3) request the pilot's intentions.

15.2.4.2.3 The pilot should take the following actions:

a) comply with the ATC clearance issued; or
b) advise ATC of intentions and execute the procedures detailed in 15.2.4.3.

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

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

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

a) if possible, deviate away from an organized track or route system;
b) establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: aircraft identification, flight level, position (including ATS route designator or the track code) and intentions, on the frequency in use and on 121.5 MHz (or, as a backup, on the inter-pilot air-to-air frequency 123.45 MHz);
c) watch for conflicting traffic both visually and by reference to ACAS (if equipped);
d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);
e) for deviations of less than 9.3 km (5.0 NM) from the originally cleared track or route, remain at a level assigned by ATC;
f) for deviations greater than, or equal to 9.3 km (5.0 NM) from the originally cleared track or route, when the aircraft is approximately 9.3 km (5.0 NM) from track, initiate a level change in accordance with Table 15-1;
g) if the pilot receives clearance to deviate from cleared track or route for a specified distance and, subsequently, requests, but cannot obtain a clearance to deviate beyond that distance, the pilot should apply an altitude offset in accordance with Table 15-1 before deviating beyond the cleared distance;
h) when returning to track or route, be at its assigned flight level when the aircraft is within approximately 9.3 km (5.0 NM) of the centre line; and
i) if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

Note.— If, as a result of actions taken under the provisions of 15.2.4.3.1, the pilot determines that there is another aircraft at or near the same flight level with which a conflict may occur, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

Table 15-1

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

8. IDENTIFICATION OF THE METHOD OF SAFETY ASSESSMENT

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

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

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

9. MODIFICATION OF THE PROPOSED SYSTEM

9.1 *System Changes*

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

- Procedural conflict probe updated to incorporate the space-based ADS-B surveillance enhanced separations covered within this implementation plan.
- Reception and application of ADS-B signals to update flight profiles.
- Enhanced conformance monitoring of ADS-B signals against cleared flight profiles.
- Monitoring of ADS-B signal quality indicators (QI).
- Various enhanced controller Human Machine Interface (HMI) which include new separations monitoring tools, improved graphical situational display and updates to flight progress strips.
- Monitoring of PBCS designators for the application of surveillance-enhanced separations.
- Automated support to determine when variable speed or fixed speed clearances can be issued.
- Automated CPDLC continuity checking.
- Enhanced separation monitoring support requirements as outlined in Annex 19.
- Adaptation tools that define areas where ASEPS can be applied.

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

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

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

10. IMPLEMENTATION AND MONITORING OF THE PROPOSED SYSTEM

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

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

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

a) RVSM/HLA approval;

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

c) Aircraft meeting the specifications for RNP 4; and

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

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

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

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

(2) insert "P2" to indicate RCP 240 approval;

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

(1) insert "D1" to indicate ADS with FANS1/A capabilities; and ii) B1 or B2 to indicate ADS-B.

c) Field 18 (Other Information); insert the characters "PBN/" followed by "L1" for RNP 4 and SUR/RSP 180

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

Failures and degradations of systems

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

11. STAKEHOLDER CONSULTATION

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

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

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

12. SUCCESS CRITERIA – Longitudinal Separation

<table>
<tr><th colspan="2">QUESTIONS</th><th colspan="2">METRICS, DETAILS & TARGETS</th></tr>
<tr><td>Safety</td><td>Safety</td><td>i) Longitudinal</td><td>Scrutinize each longitudinal error to determine if the application of the 14 NM and 17 NM separations had an effect on the error.

If such an effect is found then quantify the effect on the longitudinal risk.

Target = No increase in longitudinal risk due to the application of the 14 NM and 17 NM separations.</td></tr>
<tr><td></td><td></td><td>ii) Vertical</td><td>Scrutinize each vertical error to determine if the application of the 14 NM and 17 NM separations NM had an effect on the error.

If such an effect is found then quantify the effect on the vertical risk.

Target = No increase in vertical risk due to the application of the 14 NM and 17 NM separations.</td></tr>
<tr><td></td><td></td><td>iii) Lateral</td><td>Scrutinize each lateral error to determine if the application of the 14 NM and 17 NM separations had an effect on the error.

Lateral errors shall be determined and classified in accordance with direction provided via NAT SPG: That the:

a) following definitions be used when classifying reports made to the NAT Central Monitoring Agency (NAT CMA):
i) a lateral deviation is any actual deviation from the cleared track other than those covered by the Strategic Lateral Offset Procedures (SLOP);
ii) a Gross Navigation Error (GNE) is a lateral deviation from a cleared track by 10 Nautical Miles (NM) or more;
iii) an ATC intervention is an event where the Air Traffic Controller (ATCO) caught and corrected a lateral deviation before it developed into a GNE; and
iv) an ATC prevention is an event where the ATCO intervention prevented a lateral deviation; and

b) NAT CMA initiate GNE-related follow up actions in regard to GNEs of 10 NM or more.

If such an effect is found then quantify the effect on the lateral risk.

Target = No increase in lateral risk due to the application of the 14 NM and 17 NM separations.</td></tr>
<tr><td></td><td>Safety</td><td colspan="2">i) Monitor operator failures to correctly indicate ADS-B & PBCS capabilities resulting in ineligible flights being placed on the 14 NM and 17 NM separations.
• Scrutinize each failure to determine cause and source for the error.
ii) Monitor failures to properly transmit valid position information by ADS-B.
• achieve FANS logon, or to maintain or transfer CPDLC connection resulting in ATC reverting to another form of separation
• Scrutinize each failure to determine cause and source for the error.
iii) Monitor communication and surveillance performance against RCP 240 and the 14 NM and 17 NM separations.
• NAT TIG scrutinizes the performance twice a year to verify compliance</td></tr>
</table>

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

13. SUCCESS CRITERIA – LATERAL SEPARATION

~~TBD prior to commencement of 19 NM lateral separation.~~

QUESTIONS		METRICS, DETAILS & TARGETS	
Safety	Safety	i) Longitudinal	Scrutinize each lateral error to determine if the application of the 19 NM lateral non-intersecting separations had an effect on the error. If such an effect is found then quantify the effect on the longitudinal risk. Target = No increase in longitudinal risk due to the application of the 19 NM lateral non-intersecting separations.
		ii) Vertical	Scrutinize each vertical error to determine if the application of the 19 NM lateral non-intersecting separations had an effect on the error. If such an effect is found then quantify the effect on the vertical risk. Target = No increase in vertical risk due to the application of the 19 NM lateral non-intersecting separations.
		iii) Lateral	Scrutinize each lateral error to determine if the application of the 19 NM lateral non-intersecting separations had an effect on the error. Lateral errors shall be determined and classified in accordance with direction provided via NAT SPG: That the: a) following definitions be used when classifying reports made to the NAT Central Monitoring Agency (NAT CMA): i) a lateral deviation is any actual deviation from the cleared track other than those covered by the Strategic Lateral Offset Procedures (SLOP); ii) a Gross Navigation Error (GNE) is a lateral deviation from a cleared track by 10 Nautical Miles (NM) or more; iii) an ATC intervention is an event where the Air Traffic Controller (ATCO) caught and corrected a lateral deviation before it developed into a GNE; and iv) an ATC prevention is an event where the ATCO intervention prevented a lateral deviation; and b) NAT CMA initiate GNE-related follow up actions in regard to GNEs of 10 NM or more. If such an effect is found then quantify the effect on the lateral risk. Target = No increase in lateral risk due to the application of the 19 NM lateral non-intersecting separations.

QUESTIONS		METRICS, DETAILS & TARGETS
	Safety	iv) Monitor operator failures to correctly indicate ADS-B & PBCS capabilities resulting in ineligible flights being placed on 19 NM lateral non-intersecting separations. • Scrutinize each failure to determine cause and source for the error. v) Monitor failures to properly transmit valid position information by ADS-B. • achieve FANS logon, or to maintain or transfer CPDLC connection resulting in ATC reverting to another form of separation • Scrutinize each failure to determine cause and source for the error. vi) Monitor communication and surveillance performance against RCP 240 and the 14 19 NM lateral non-intersecting separations. • NAT TIG scrutinizes the performance twice a year to verify compliance.

APPENDIX H — NAT OPS BULLETIN - OPERATIONAL TRIAL OF ASEPS (19 NM LATERAL SEPARATION BETWEEN NON-INTERSECTING TRACKS) USING ADS-B (SERIAL NO: 2019_002)

(*paragraph 2.7.8 refers*)

NAT OPS BULLETIN

Serial Number: **2019_002**	**Issued: TBC 2019**
Subject: Trial Implementation of ASEPS (Lateral) using ADS-B	**Effective: 10 OCT 2019**
Originator: NAT SPG	

The purpose of this North Atlantic Operations Bulletin is to promulgate information concerning the expansion of the trial of Advanced Surveillance-Enhanced Procedural Separation (ASEPS) using Automatic Dependent Surveillance- Broadcast (ADS-B), to include lateral spacing of 19 NM, in the Shanwick, Gander and Santa Maria Oceanic Control Areas which will commence on or soon after 10 October 2019.

Any queries about the content of the attached document should be addressed to*: ICAO EUR/NAT Office:* ***icaoeurnat@paris.icao.int***

The NAT OPS Bulletin Checklist is available at ***www.icao.int/EURNAT/EUR & NAT Documents****,* ***NAT Documents****, then* ***NAT Ops Bulletins*****.**

1. INTRODUCTION

1.1 The expansion of automatic dependent surveillance – broadcast (ADS-B) service, as facilitated by receivers hosted on satellites, into oceanic and remote areas previously limited by ground-based ATS surveillance systems is making it possible to maintain a safe, orderly and expeditious flow of air traffic using smaller air traffic control separation standards than are required today. Used together with the existing ground based ATS surveillance infrastructure, space-based (SB) ADS-B is permitting uninterrupted ATS surveillance for equipped aircraft before, during and after entry into the North Atlantic (NAT) Region.

1.2 With the anticipated expansion of ADS-B availability into oceanic and remote areas, the ICAO Separation and Airspace Safety Panel (SASP) was tasked to develop proposals for ADS-B separation minima for implementation in oceanic and remote enroute airspace. The proposed minima (described below) can be used between aircraft meeting the specifications for RNP 4 and RCP 240 where ADS-B service is provided and Controller Pilot Data Link Communications (CPDLC) is available.

1.3 On the 28 March 2019, Shanwick, Gander and Santa Maria Oceanic Control Areas commenced a trial implementation of the following longitudinal separations. Application of the ATS Surveillance based procedural longitudinal separation was as per the PANS ATM, Doc 4444 proposal for amendment from the ICAO SASP, as paraphrased below:

a) 17 NM longitudinal separation of aircraft operating on same track or intersecting tracks provided, that the relative angle between the tracks is less than 90 degrees.

b) 14 NM provided the relative angle between the tracks is less than 45 degrees.

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

1.4 On or soon after the 10 October 2019, Shanwick, Gander and Santa Maria Oceanic Control Areas will commence a trial implementation of 19 NM lateral spacing between parallel or non-intersecting tracks. Operators will be advised via Aeronautical Information Circular (AIC) of the commencement of lateral ASEPS implementation trial.

2. GENERAL

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

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

2.3 Flight crews are expected to comply with the normal non-surveillance based procedures, which include position reports via voice or ADS-C, and all other operator specific procedures currently used.

2.4 Application of the ATS surveillance based separations where direct controller-pilot VHF voice communications is not available requires aircraft meeting the specifications for RNP 4, RCP 240 and RSP 180 as annotated by the appropriate designator in the ICAO flight plan.

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

3. QUALIFICATIONS TO PARTICIPATE IN THE TRIAL

3.1 Eligible flights are those that meeting the following requirements:

a) RVSM/HLA approval

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

c) Aircraft meeting the specifications for RNP 4

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

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

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

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

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

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

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

ii) B1 or B2 to indicate ADS-B.

c) Field 18 (Other Information); insert the characters "PBN/" followed by "L1" for RNP 4 and SUR/RSP 180

3.3 Operators do not have to apply to be part of the trial. As long as they meet the qualifications above, they will be participants in the trial.

3.4 If the ACAS II system is not operational but the flight is authorised based on State MEL relief provisions, the operator may request a clearance that does not result in the application of ASEPS lateral separation. This would be done by the pilot advising Gander, Santa Maria or Shanwick ATC:

- Prior to entry from adjacent ACC- During Oceanic Clearance Request with Gander, Santa Maria or Shanwick ATC, by stating in voice request or including 'RMK/NO ACAS' via OCL request or;
- Prior to entry from New York or Iceland OACs- Via HF or SATCOM Voice 30 minutes before the Gander, Santa Maria or Shanwick OCA boundaries or;
- After entry - Via HF or SATCOM Voice as soon as possible after failure of ACAS II system is detected.

4. STRATEGIC LATERAL OFFSET PROCEDURE (SLOP)

4.1 The Strategic Lateral Offset Procedures (SLOP), implemented as a standard operating procedure in the NAT Region remains applicable.

5. CONTINGENCY PROCEDURES

5.1 There are significant revisions to the current ICAO Doc 4444 Contingency Procedures. Coincident with the separations listed above, SASP has proposed changes to ICAO Doc 4444 Contingency Procedures. These procedures along with the revised weather deviation procedures have been included in a revised version of NAT Doc 007 Operations and Airspace Manual, and in the *Special Procedures For In-Flight Contingencies NAT Ops Bulletin (Serial No:2018_005 Rev01)* for the duration of the trial and until such time they are published in ICAO Doc 4444. ;

- a reduction in the offset distance to 9.3 km (5 NM) (also included for weather deviation)
- a strong recommendation for pilots to consider a descent below the predominant flow of traffic in a parallel track system where the aircraft's diversion path will likely cross adjacent tracks or routes. A descent below FL 290 can decrease the likelihood of: conflict with other aircraft, ACAS RA events and delays in obtaining a revised ATC clearance.

6. TRIAL PERIOD

6.1 The longitudinal and lateral trial will run until November 2020 or when PANS ATM, Doc 4444 proposal for amendment from the ICAO SASP is published, whichever is the later. It is anticipated that the amendments will become effective on 5 November 2020.

6.2 A review will take place and a decision will be made to implement ASEPS on a permanent operational basis.

6.3 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 documents.

7. CONTACTS

7.1 The following individuals may be contacted for information or to provide feedback on this operation trial:

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APPENDIX I — CONCEPT OF OPERATIONS FOR THE PROVISION OF OPERATIONS WITHOUT AN ASSIGNED FIXED SPEED (OWAFS) IN THE NAT

(*paragraph 2.9.6 refers*)

Concept of Operations for the Provision of Operations Without an Assigned Fixed Speed in the North Atlantic Region

February 2019

1. Overview

1.1 This document provides the North Atlantic (NAT) Region Concept of Operations (CONOPS) for the introduction of Operations Without an Assigned Fixed Speed (OWAFS). This capability will enhance operator fuel and time efficiencies and reduce greenhouse gas (GHG) emissions.

1.2 The requirement to issue an assigned fixed Mach to all flights has been removed from NAT SUPPs (ICAO Doc7030), however, due to the technical design of the ACARS Clearance (CLX) message and NAT Air Navigation Service Providers (ANSP) application of longitudinal separation using the Mach number technique, nearly all oceanic clearances issued to turbojet aircraft in the NAT Region include an assigned Mach. If any variation to the assigned Mach is desired, flight crews must request such changes from ATC.

1.3 Aircraft manufacturers, however, recommend a variable cruise Mach operation for maximum efficiency. Thus, the assumption that most flights would prefer to operate in the NAT region without a fixed Mach speed.

1.4 A limited trial removing the fixed Mach (or using a Mach range) was performed in 2017 by selected flights, with the majority of the participating aircraft on random routes. There were positive results in both fuel and time savings. Because of the traffic levels in the NAT (especially on the OTS), it is recognized that a 100% utilization of OWAFS may not be realistic. However, the benefits from any use could be significant.

2. Purpose and Scope

2.1 The purpose of this CONOPS is to support the use of each aircraft's Flight Management Computer's (FMC) ability to apply flexible speeds as permitted under ICAO Annex 2. State AIPs, and ANSP Flight Data Processing Systems (FDPS), will be updated to facilitate OWAFS.

2.2 OWAFS may be offered within all Oceanic Control Areas (OCAs) in the NAT region (New York Oceanic East, Bodo, Gander, Reykjavik, Shanwick, and Santa Maria). It would involve the participation, coordination and cooperation of the U.S. Federal Aviation Administration (FAA) Air Traffic Organization (ATO), NavCanada, Isavia, NATS UK, Avinor and NavPortugal.

2.3 This CONOPS has been developed through the collaborative efforts of each of the ANSPs involved, as well as aviation industry representatives from IATA, IFALPA and IBAC. The ANSPs, the NAT operators, and their flight crews are considered the key stakeholders in this initiative. Factors affecting the responsibilities of each party must be considered in planning for the implementation of OWAFS in the NAT.

2.4 This CONOPS focuses on a description of the higher-level components of the "system" that constitutes OWAFS. Specific system requirements and implementation tasks will be addressed separately as they are identified and defined.

3. Background of OWAFS

3.1 Both Boeing and Airbus recommend the use of a FMC variable speed as the most efficient means of operation. The FMC generated speed will vary depending on the wind and the temperature. Using an FMC variable speed allows the aircraft to accelerate into a headwind and decelerate with a tailwind. In addition, it allows for a more accurate step climb profile. During a NAT crossing using OWAFS, the speed will typically only vary within a +/- .01 Mach; within the range specified in ICAO Annex 2. Operators flight plan using forecast winds and temperatures, which are available every 6 hours, along with estimated passenger and cargo loads. The time difference between generating the flight plan and the departure of the flight can be significant. That time difference is exacerbated by the flight time from the departure airport to the NAT oceanic entry point. The actual weight of the aircraft, along with the potential change in forecast winds and temperature, is what makes the application of a variable Mach beneficial to operators.

3.2 Operations in accordance with the provisions of ICAO Annex 2 (3.6.2.2 c) see 4.5 c) are successfully used in other oceanic areas.

4. OWAFS Concepts and Requirements

4.1 Aircraft

All aircraft, regardless of FANS equipage, will be eligible for the application of OWAFS in both non ATS surveillance and ATS surveillance airspace.

4.2 NAT Oceanic Clearance

a) Current ACARS / Voice oceanic clearance procedures will be retained.

b) Oceanic clearance procedures will remain unchanged.

4.3 NAT ANSPs

a) NAT ANSPs will strive to remove a speed restriction when operationally feasible.

b) AIDC message will be the primary mode of OWAFS coordination and communication between NAT ANSPs.

c) NAT ANSPs will perform software changes to accommodate a variable speed and support standardized ANSP AIDC coordination procedures.

d) There will be two modes of operation regarding speed:

(1) Clearance with assigned speed;

(i) Single speed (ex. M.80)

(2) No speed assignment- provisions of ICAO Annex 2 (3.6.2.2 c) see 4.5 c) apply.

e) ATC will apply “speed control” as needed in accordance with guidance in ICAO Doc 4444, paragraph 5.4.2.1.2.

4.4 Voice and CPDLC Terminology

a) The terms Cost Index or ECON should not normally be used in communications between ATC and aircraft with respect to the authorization for or use of OWAFS.

b) Implementation of OWAFS will make use of the existing CPDLC message set and/or standard voice phraseology.

c) The following common phraseology, between ATC and flight crew, will be implemented across the NAT:

(1) To clear aircraft on a fixed speed:

(i) Voice (PANS-ATM 12.3.2.8): MAINTAIN MACH (number)

(ii) CPDLC: SPDU-4/UM106: MAINTAIN (speed)

(iii) ACARS data link oceanic clearance (ED-106): Assigned Mach speed is required in oceanic CLX messages

(2) To remove the speed restriction:

(i) Voice (PANS-ATM 12.4.1.6): RESUME NORMAL SPEED

(ii) CPDLC: SPDU-13/UM116: RESUME NORMAL SPEED

(3) Response to a pilot inquiry:

(i) Voice (PANS-ATM 12.4.1.6): NO [ATC] SPEED RESTRICTIONS

(ii) CPDLC SPDU-14/UM169 (free text): NO SPEED RESTRICTION

4.5 Flight Crews

a) If aircraft has been cleared on a fixed Mach speed;

(1) Flight crew will not need to request OWAFS, ATC will offer OWAFS when possible.

(2) Flight crew abides by ICAO Annex 2 (paragraph 3.6.2.2 b) *Deviation from ATC assigned Mach number/indicated airspeed: the appropriate air traffic services unit shall be informed immediately.*

b) If the aircraft then receives RESUME NORMAL SPEED (via CPDLC or Voice), the flight crew no longer needs to comply with a previously issued Mach. However, the flight crew shall advise ATC if, as the result of the RESUME NORMAL SPEED message, they intend to adjust their speed by plus or minus Mach 0.02 or more from their last assigned speed.

4.6 General

a) OWAFS will be offered to aircraft whenever the opportunity exists.

b) OWAFS will be managed by each NAT ANSP in a manner dictated by required separation standards and safety of operations.

c) OWAFS coordination procedures between ANSPs will be in accordance with the PAN AIDC ICD.

d) Inter-unit agreements will be put into place when necessary and used as a coordination mechanism to implement OWAFS across blocks of airspace.

5. OWAFS Operational Scenario

The following scenario illustrates how OWAFS could be implemented for a NAT flight, using the concepts presented in section 4 of this CONOPS.

5.1 Pre-Oceanic Entry

a) Airline operator files a flight plan for flight number AB 123 with a NAT crossing speed of M.81.

b) Prior to the oceanic entry point (OEP), AB 123 requests an oceanic clearance with a speed of M.81.

c) ATC issues oceanic clearance for AB 123 that includes an assigned speed of M.81.

5.2 Established in Oceanic Airspace

a) ATC controlling AB 123 assesses the traffic situation with other aircraft.

b) If the required minimum is sufficiently ensured:

(1) For CPLDC equipped aircraft an uplink message SPDU-13/UM116 RESUME NORMAL SPEED will be sent

(2) For aircraft without CPDLC capability, a voice message RESUME NORMAL SPEED will be sent

c) The flight crew must inform ATC if the flight either slows to M.79 or less or speeds up to M.83 or more from their current flight plan speed which is determined by the last ATC cleared speed as result of a cost index adjustment to the FMS.

d) ATC monitors AB 123's progress, and its separation from other aircraft, in accordance with normal operating procedures.

e) ATC coordinates with the receiving ANSP in accordance with inter-unit agreements.

f) Upon arrival at the new OCA boundary, AB 123 continues to operate without assigned speed.

g) As a result of a change in the tactical situation, and OWAFS can no longer be offered, AB123 receives a CPDLC uplink SPDU-4 (UM106) MAINTAIN (speed - in this case M.81), or the equivalent clearance by voice, signifying a cessation of OWAFS due to conflicts.

h) Following resolution of conflicts, ATC again applies the procedures described before (5.2 b), allowing the flight crew to resume normal speed (5.2 c).

6. Summary

6.1 Efficiencies

Commercial aircraft manufacturers (Boeing and Airbus) recommend a variable cruise Mach for the greatest efficiencies in both time and fuel which trialled flights have confirmed. Although there are international general aviation aircraft that prefer a high fixed Mach over any variable speed, the OWAFS project team agrees that allowing aircraft to fly a variable speed will be beneficial to the majority of operators.

6.2 Flight Crew / ATC Information

Appropriate education will be required to ensure a thorough understanding of OWAFS policies and procedures especially in regard to responses to standard voice or CPDLC messages relating to speed assignments.

6.3 Software Upgrades

a) ANSPs would likely need to make some modifications to their FDPS to implement OWAFS. Team members identified user interfaces, fixed-time calculations, conflict prediction software, and clearance formatting as likely components of FDPS modification.

b) NAT ANSPs generally believe all required FDPS modifications could be completed within two years. It is not clear whether some limited version of OWAFS could be offered before all longer term FDPS modifications are completed.

6.4 Human Factors

In addition to controller workload, NAT ANSPs expressed "controller unease" issues. Specific concern relates to the impact on ATCOs, namely, in the case of oceanic separation minimums being reduced (e.g. PBCS implementation), and controllers being asked to demonstrate more flexibility and tolerance with regard to maintaining appropriate separation standards. NAT ANSPs will need to assess any impact on ATC responsibilities prior to the implementation of OWAFS in their respective airspace, as part of their safety assessment activities.

6.5 Documentation

ICAO EUR/NAT will publish the NAT OPS Bulletin developed for implementation of OWAFS.

6.6 The OWAFS project was initiated to address the current ATC requirement for the routine assignment of a fixed speed in the North Atlantic. ATC application of OWAFS represents a change to legacy oceanic air traffic control procedures for NAT ANSPs. All NAT ANSPs and IATA shall provide annual reports to the autumn meeting of the NAT POG who would then assess whether the application of OWAFS provided additional operator efficiencies and analyse any adverse impact on air traffic management. Post-implementation monitoring should be kept to the minimum necessary to meet the objective and be terminated when the requirement for the routine assignment of fixed speed was removed from operations in the NAT region.

APPENDIX J — NAT OPS BULLETIN – OPERATIONS WITHOUT AN ASSIGNED FIXED SPEED (OWAFS) IN THE NAT (SERIAL NO: 2019_001)

(*paragraph 2.9.6 refers*)

NAT OPS BULLETIN

Serial Number: **2019_001**
Subject: Operations Without an Assigned Fixed Speed in the NAT (OWAFS) Special Emphasis Items (SEI)
Originator: NAT SPG

Issued: tbc 2019
Effective: tbc 2019

The purpose of North Atlantic Operations Bulletin 2019-001 is to provide background information and guidance material to support the use of the aircraft's Flight Management Computer's (FMC) ability to apply flexible speeds in the NAT as permitted under ICAO Annex 2. The implementation of operations without an assigned speed (OWAFS), will enhance operator fuel and time efficiencies and reduce greenhouse gas (GHG) emissions. State AIPs, ANSP Flight Data Processing Systems (FDPS), AIDCs and operator and flight crew education should be updated accordingly to facilitate OWAFS.

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

*ICAO EUR/NAT Office: **icaoeurnat@paris.icao.int***

NOTICE

*The NAT OPS Bulletin Checklist is available at **www.icao.int/EURNAT/EUR & NAT Documents**, **NAT Documents**, then **NAT Ops Bulletins**.*

NAT OPERATIONS BULLETIN – Operations Without an Assigned Fixed Speed

1. INTRODUCTION

1.1. The requirement to issue an assigned fixed Mach to all flights has been removed from NAT SUPPs (ICAO Doc7030), however, due to the technical design of the ACARS Clearance (CLX) message and NAT Air Navigation Service Providers (ANSP) application of longitudinal separation using the Mach number technique, nearly all oceanic clearances issued to turbojet aircraft in the NAT Region include an assigned Mach. If any variation to the assigned Mach is desired, flight crews must request such changes from ATC.

1.2. Aircraft manufacturers, however, recommend a variable cruise Mach operation for maximum efficiency. Thus, the assumption that most flights would prefer to operate in the NAT region without a fixed Mach speed.

1.3. AIS publications of the NAT ATS Provider States should be consulted to determine the extent of current implementation of OWAFS in each of the NAT OCAs. Operational procedures to be used are specified in this Bulletin. These procedures are intended to facilitate the uniform application of Standards and Recommended Practices contained in:

- Annex 2 — Rules of the Air,
- Annex 10 — Aeronautical Telecommunications and
- Annex 11 — Air Traffic Services,
- The provisions in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444) and, when applicable, the Regional Supplementary Procedures (Doc 7030).

This Bulletin may be updated, as necessary, as progress is made toward improved OWAFS procedures in the NAT.

1.4. Operator attention is directed to Attachment A which provides a "quick reference" for OWAFS. It is intended to be used as a job aid for operators developing pilot training material.

1.5. 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. OPERATIONS WITHOUT AN ASSIGNED FIXED SPEED OVERVIEW

2.1. All aircraft, regardless of FANS equipage, will be eligible for the application of OWAFS in both ATS surveillance and non-surveillance airspace.

2.2. Current ACARS / Voice oceanic clearance procedures will be retained.

2.3. Oceanic clearance procedures will remain unchanged. A fixed Mach will continue to be part of the oceanic clearance.

2.4. ANSPs will strive to remove a speed restriction when operationally feasible.

2.5. There will be two modes of operation regarding speed:

a) Clearance with an assigned speed

b) No speed assignment—provisions of ICAO Annex 2 (paragraph 3.6.2.2 apply)

2.6. ATC will apply "speed control" as needed in accordance with guidance in ICAO Doc 4444.

2.7. The terms Cost Index or ECON should not normally be used in communications between ATC and aircraft with respect to the authorization for or use of OWAFS.

2.8. Implementation of OWAFS will, where possible, make use of existing CPDLC message sets and/or standard voice phraseology.

2.9. The following common phraseology, between ATC and flight crew, will be implemented across the NAT:

a) To clear aircraft on a fixed speed:

   1) Voice: MAINTAIN MACH (number)

   2) CPDLC: SPDU-4/UM106: MAINTAIN (speed)

   3) ACARS data link oceanic clearance: Assigned Mach speed is required in oceanic CLX messages

b) To remove the speed restriction:

   1) Voice: RESUME NORMAL SPEED

   2) CPDLC: SPDU-13/UM116: RESUME NORMAL SPEED

c) Response to a pilot inquiry:

   1) Voice: NO [ATC] SPEED RESTRICTIONS

   2) CPDLC SPDU-14/UM169 (free text): NO SPEED RESTRICTION

2.10. If aircraft has been cleared on a fixed Mach speed;

a) Flight crews will not need to request OWAFS, ATC will offer a variable Mach when possible.

b) Flight crew abides by ICAO Annex 2 (paragraph 3.6.2.2 b) *Deviation from ATC assigned Mach number/indicated airspeed: the appropriate air traffic services unit shall be informed immediately.*

2.11. If the aircraft then receives RESUME NORMAL SPEED (via CPDLC or Voice), the flight crew no longer needs to comply with a previously issued Mach. However, the flight crew shall advise ATC if, as the result of the RESUME NORMAL SPEED message, they intend to adjust their speed by plus or minus Mach 0.02 or more from their last assigned speed.

2.12. OWAFS will be offered to aircraft whenever the opportunity exists.

2.13. OWAFS will be managed by each NAT ANSP in a manner dictated by required separation standards and safety of operations.

3. OWAFS OPERATIONAL SCENARIO

3.1. Pre-Oceanic Entry:

a) Airline operator files a flight plan for flight number AB 123 with a NAT crossing speed of M.81.

b) Between 90 and 60 minutes prior to the oceanic entry point (OEP), AB 123 requests an oceanic clearance with a speed of M.81.

c) ATC issues oceanic clearance for AB 123 that includes an assigned speed of M.81.

3.2. Established in Oceanic Airspace:

a) ATC controlling AB 123 assesses the traffic situation with other aircraft.

b) If the required minimum is sufficiently ensured:

   1) For CPLDC equipped aircraft an uplink message SPDU-13/UM116 RESUME NORMAL SPEED will be sent

   2) For aircraft without CPDLC capability, a voice message RESUME NORMAL SPEED will be sent;

c) The flight crew no longer needs to comply with a previously issued Mach. However, the flight crew shall advise ATC if, as the result of the RESUME NORMAL SPEED message, they intend to adjust their speed by plus or minus Mach 0.02 or more from their last assigned speed. In this case, with a previously assigned speed of .81, they must inform ATC if the flight either slows to M.79 or less or speeds up to M.83 or more.

d) ATC monitors AB 123's progress, and its separation from other aircraft, in accordance with normal operating procedures.

e) ATC coordinates with the receiving ANSP in accordance with inter-unit agreements.

f) Upon arrival at the new OCA boundary, AB 123 continues to operate without assigned speed.

g) As a result of a change in the tactical situation, and OWAFS can no longer be offered, AB123 receives a CPDLC uplink SPDU-4 (UM106) MAINTAIN (speed - in this case M.81), or the equivalent clearance by voice, signifying a cessation of OWAFS due to conflicts.

h) Following resolution of conflicts, ATC again applies the procedures described before, allowing the flight crew to resume normal speed.

4. SUMMARY

4.1. Appropriate flight crew education will be required to ensure a thorough understanding of OWAFS policies and procedures especially in regard to responses to standard voice or CPDLC messages relating to speed assignments.

5. CONTINGENCY PROCEDURES

5.1. Advise ATC immediately of any data link issues that might affect FANS (CPDLC/ADS-C) data link operations or any situation, like weather conditions, that require a more significant speed change.

6. WEBSITES

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.

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ATTACHMENT A – SUMMARY OF OPERATIONS WITHOUT AN ASSIGNED FIXED SPEED SPECIAL INTEREST ITEMS CONTAINED IN THIS NAT OPS BULLETIN

SPECIAL EMPHASIS ITEMS FOR OWAFS PROCEDURES. **The Special Emphasis Items (SEI) listed below should be part of the flight crew education** required to ensure a thorough understanding of OWAFS policies and procedures especially in regard to responses to standard voice or CPDLC messages relating to speed assignments.

Flight Crew

- Should ensure a FANS (CPDLC/ADS-C) connection with the appropriate oceanic control area.
- Can request RESUME NORMAL SPEED via CPDLC (if not offered);
- Should insert the appropriate current flight plan "cost index" (ECON) into the FMS. This should typically be within +/- .01 Mach of the assigned Mach;
- Must inform ATC if as a result of the RESUME NORMAL SPEED uplink and subsequent insertion of cost index (ECON) the speed varies plus or minus Mach 0.02 or more from the assigned Mach via CPDLC or voice; and
- ATC will assign a fixed Mach if variable Mach can no longer be supported

CPDLC Uplink Messages in support of OWAFS

CPDLC UPLINK OR VOICE	MESSAGE MEANING	REASON ATC WOULD UPLINK	CREW ACTION
RESUME NORMAL SPEED	Instruction to resume a normal speed. The aircraft no longer needs to comply with a previously issued speed restriction	Allows for the use of cost index to produce a variable Mach. Fixed Mach is no longer required	Insert the appropriate cost index into the FMC that should typically ~~to~~ produce a Mach within +/- .01 Mach of the assigned Mach
MAINTAIN [speed]	Instruction to maintain the specified speed	An assigned speed is required for traffic separation	Insert the assigned Mach into the FMC and comply with the instruction

Contingency Procedures

- Advise ATC immediately of any data link issues that might affect FANS (CPDLC/ADS-C) data link operations or any situation, like weather conditions, that require a more significant speed change.

APPENDIX K — TASK LIST FOR IMPLEMENTATION OF OPERATIONS WITHOUT AN ASSIGNED FIXED SPEED (OWAFS) IN THE NAT

(*paragraph 2.9.6 refers*)

(updated on 7 May 2019)

Task ID	Subject	Key Implementation Tasks	Record of Updates	Next Step	Lead(s) ***NOTE:*** ***Leads will coordinate with groups identified in next column***	Coordination	Completion Date	Status
1	Task List and Schedule	Develop a Task List and Schedule for completion of individual tasks for implementation of Operations without an Assigned Fixed Speed (OWAFS)	None	Submit final draft Task List for review to POG/06 Submit to IMG/53 for approval	NAT POG (OWAFS PT)	NAT TIG NAT IMG	October 2018 (NAT IMG/53)	Draft complete / On Track
2	Concept of Operations (CONOPS)	Develop CONOPS to support implementation of OWAFS	OWAFS Draft CONOPS presented to POG/05 & IMG/52	Submit final draft CONOPS for review to POG/06 Submit to IMG/53 for approval	NAT POG (OWAFS PT)	NAT IMG	October 2018 (NAT IMG/53)	Draft complete / On Track
3	ANSP FDPS System Modification	Confirmation of ANSP FDPS system modification schedule to support an automated process of OWAFS.	BIRD – Q4 2019 ENOB- TBC CZQX – Q1 2020 ~~4 2019~~ EGGX – Q1 2020 ~~4 2019~~ LPPO – Q4 2019 KZWY – Q4 2019	BODO to confirm schedule to support OWAFS	State ANSPs	NAT POG	September 2018 (NAT POG/06)	Open / On Track

Task ID	Subject	Key Implementation Tasks	Record of Updates	Next Step	Lead(s) ***NOTE:*** ***Leads will coordinate with groups identified in next column***	Coordination	Completion Date	Status
4	Advance notice to User States and Operators	Develop & publish NAT Ops Bulletin	None	Draft NAT Ops Bulletin for review by POG/06 Submit to IMG/53 for approval Publish NAT Ops Bulletin	NAT POG	NAT TIG NAT IMG	Minimum of 2 AIRAC Cycles before implementation ~~(Expected to start Q1 2019)~~ August 2019 AIRAC	Open / On Track
5	Pre-implementation Safety Assessment & Implementation Decision.	Update and complete final Safety Assessment and Implementation Readiness Review to support implementation of OWAFS	None	Complete Safety Assessment and Implementation Readiness Review no later than the implementation date as shown in Task 7. This is a local task for each ANSP before implementation in accordance with standard safety assessment procedures.	NAT State ANSPs	NAT POG	Before implementation date as shown in Task 7	Open / On Track
6	Post implementation monitoring	Develop common criteria for monitoring and reporting benefit delivery	None	~~Inclusion of monitoring criteria and reporting metrics within CONOPS Provide updates to maximum of two NAT POG meetings from commencement of OWAFS~~ All NAT ANSPs and IATA shall provide reports to the NAT POG	State ANSPs and IATA	NAT POG	TBC	Open / On Track

Task ID	Subject	Key Implementation Tasks	Record of Updates	Next Step	Lead(s) ***NOTE:*** ***Leads will coordinate with groups identified in next column***	Coordination	Completion Date	Status
				who would then assess whether the application of OWAFS provided additional operator efficiencies and analyse any adverse impact on air traffic management.				
7	Update to State AIPs	Update to State AIPs confirming final implementation of OWAFS and issue an AIC as necessary	None	Publish Updated State AIPs	State ANSPs NAT IMG	NAT POG	Minimum of 3 months prior to first implementation	Open / On Track

APPENDIX L — 2018 NAT ANNUAL SAFETY REPORT (ASR)

(*paragraph 3.1.3 refers*)

International Civil Aviation Organization (ICAO) North Atlantic Region

2018 Annual Safety Report

Executive Summary

The North Atlantic Region's sixth annual safety report is issued by ICAO's North Atlantic (NAT) Systems Planning Group (NAT SPG). The NAT SPG continuously studies, monitors and evaluates the air navigation system in the NAT Region in light of changing traffic characteristics, technological advances and updated traffic forecasts. The number of flight hours in the North Atlantic (NAT) High Level Airspace (HLA) in 2018 was 2,087,743. The traffic in the Region is expected to grow at an average annual growth rate of 3.5% over the next 5 years. The objective of the NAT SPG member States is to maintain and, where possible, improve the agreed safety standards in all activities supporting the provision of air navigation services in the NAT Region. The NAT SOG is responsible to the NAT SPG for safety oversight in the NAT Region.
Safety performance in the NAT HLA is measured and monitored by the use of 12 Safety Key Performance Indicators (SKPIs) and by two Collision Risk Estimates in the lateral and vertical domains. For the year 2018, seven (7) targets were met as the following SPKIs decreased when compared to the previous three-year period of performance (2015-2016-2017):

- The rate of Large Height Deviation (LHD) per flight hours flown in the NAT HLA involving operations with Data Link in use.
- The percentage of Long Duration LHD events
- Rate of minutes that aircraft, with Data Link not in use, spent at the wrong flight level
- Rate of losses of separation per flight hours flown in the NAT HLA in the vertical domain.

The vertical collision risk for 2018 was estimated to be 76.4 x 10^{-9} fatal accidents per flight hour (fapfh) for all NAT HLA, which represents an increase of 66% compared to 2017. Incorporating the estimated benefits of SLOP reduces the vertical collision risk by 78% to 16.9 x 10^{-9} fapfh. The use of SLOP should therefore be encouraged at all NAT related user forums. The lateral collision risk for the year is estimated to be 13.8 x 10^{-9} fapfh, which represents an increase of 8% compared to 2017. The biggest contribution to the lateral Collision Risk in 2018 was a total of 162 minutes spent on an incorrect track.

The scrutiny of the 263 events and prevented events that have occurred in the NAT HLA in 2018 showed that the top 5 contributing issues were related to flying, or intending to fly the planned route instead of the cleared route, ATC coordination errors, waypoint entry or deletion errors by flight crews, equipment failure/malfunction, and non-adherences to ATC clearances. The top 2 human error types associated with these contributing issues were:

- Action, when an ATCO or flight crew made a selection, timing or positioning error, and/or omitted a required action, and/or transmitted, recorded or entered unclear or incorrect information and/or did not transmit or record required information
- Perception, when an ATCO or flight crew mis-saw or mis-heard information, and/or misunderstood visual information/auditory information, resulting in an erroneous mental representation of the situation.

Workload management and decision making error types were also identified as contributors to deviations in 2018, but to a lesser extent than Action and Perception error types.

The practices of requiring position reporting of "NEXT and NEXT +1" and of requiring the "CONFIRM ASSIGNED ROUTE" CPDLC message sets (UM137/DM40) proved to be of benefit again in 2018, as they were used for 59% and 35% respectively out of the 116 events for which either the Air Traffic Controller (ATCO) caught and corrected a lateral deviation before it developed into a GNE, or the ATCO prevented a deviation or an uncoordinated flight profiles entering the airspace of another ANSP.

The North Atlantic Scenario

The airspace of the North Atlantic, which links Europe and North America, is the busiest oceanic airspace in the world. The NAT Region is a pioneer in the implementation of advanced procedures and technology supporting the progress of the global air navigation and aviation safety plans.

Traffic mainly flows in a broadly East-West orientation in a twice daily pattern where a daily organized track system takes account of airspace users' needs and weather patterns. NAT core traffic flow is almost exclusively jet transport aircraft that operate in the upper airspace in the en-route phase of flight. This core traffic operates for a large part without radar surveillance and increasingly with the use of Automatic Dependent Surveillance-Contract (ADS-C) and Automatic Dependent Surveillance-Broadcast (ADS-B). Communication is to a large extent based on satellite based data link, also referred to as Controller-Pilot Data Link Communications (CPDLC), with High Frequency radio being utilized less often. This leads to air traffic management and operation that is fundamentally different in concept to typical domestic operations, with a greater focus on strategic rather than tactical techniques.

The number of flight hours in the NAT HLA in 2018 was 2,087,743. The NAT Economic, Financial and Forecast Group (NAT EFFG) estimates that in 2018, during the peak week of July 15 to July 21, approximately, 14,103 flights crossed the North Atlantic. The NAT EFFG expects traffic in this Region to grow at an average annual growth rate of 3.5% over the next 5 years, as shown on Figure 1. The long-term average annual growth rate from 2018 to 2038 is expected to be somewhere between 2.3% and 3.3%.

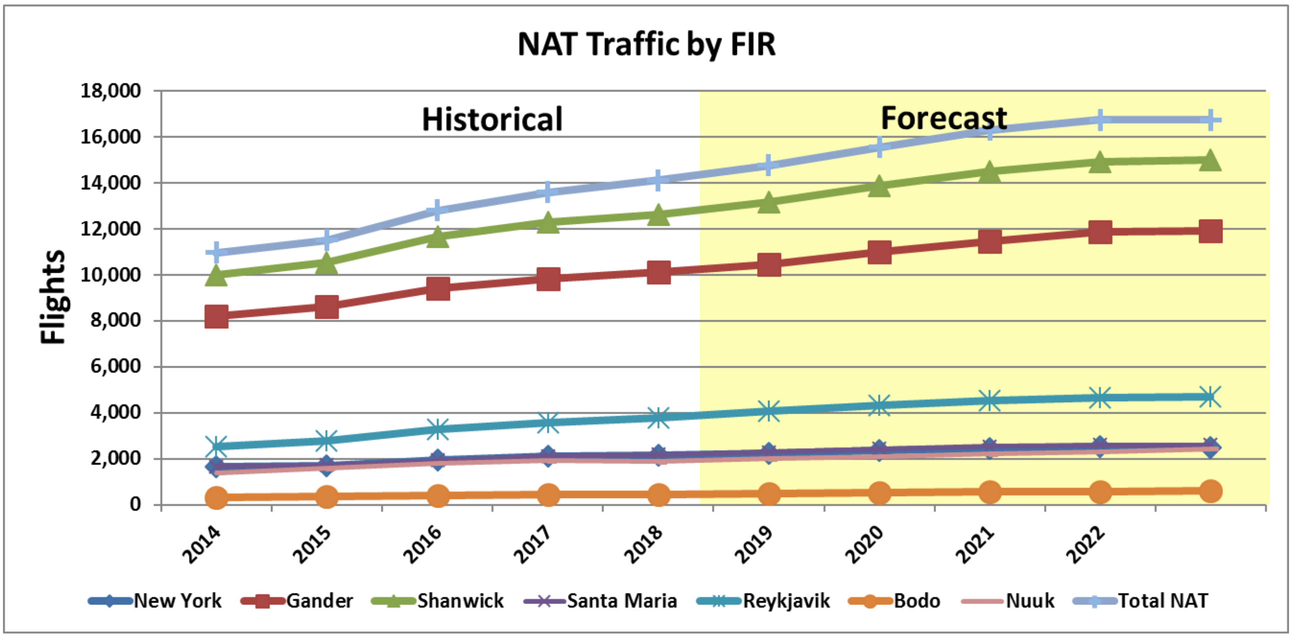


Figure 1: NAT Traffic by FIR

This continuously increasing demand in the busiest oceanic airspace in the world underlines the importance of the work conducted by the NAT Safety Oversight Group (SOG) to ensure that the highest level of safety performance is achieved in the NAT Region while maintaining a high level of capacity and efficiency.

Safety Policy

Safety is the NAT SPG's core business function. The NAT SPG is committed to developing, implementing, maintaining and constantly improving strategies and processes to ensure that all our aviation activities take place under a balanced allocation of organizational resources. The NAT SPG will aim to achieve the highest level of safety performance and meet regional safety objectives in line with national and international standards, the Global Aviation Safety Plan (GASP), and the Global Air Navigation Plan (GANP).

Objective

The objective of the NAT SPG member States is to maintain and, where possible, improve the agreed safety standards in all activities supporting the provision of air navigation services in the NAT Region:

- All involved States are accountable for the delivery of the agreed level of safety performance in the provision of air navigation services in the North Atlantic Region.
- All involved States are accountable for the delivery of the agreed level of safety performance in aircraft operations in the North Atlantic Region.
- Safety in the NAT Region is managed through the organization and activities of the relevant implementation and oversight groups established by the NAT SPG, in coordination with the non-member States and observers, to achieve its Safety Objective.

Guiding Principles

The NAT SPG will act to:

- **Clearly** define all accountabilities and responsibilities for the delivery of safety performance with respect to the provision of air navigation services and participation in the NAT SPG and its contributory bodies;
- **Support** the safety management activities that will result in an organizational culture that fosters safe practices, encourages effective safety reporting and communication, and actively manages safety within the NAT Region;
- **Share** safety related data, knowledge and expertise with concerned stakeholders;
- **Disseminate** safety information and NAT operating requirements to stakeholders;
- **Establish and implement** hazard identification and risk management processes in order to eliminate or mitigate the safety risks associated with air navigation services supporting aircraft operations in the North Atlantic Region;
- **Establish and measure** NAT Region safety performance against agreed safety standards; and
- **Continually improve** our safety performance through safety management processes.

The NAT safety policy is aligned with the Global Aviation Safety Plan (GASP). All NAT provider States have met the near-term objective of the GASP, which was to achieve effective safety oversight by 2017 and are working towards SSP implementation and predictive risk management, particularly in the areas of proactively managing risks through the identification and control of existing or emerging safety issues.

All of the NAT member States contribute experts to the NAT SPG, or one or more of its various subgroups, and so support the overall management of safety in the Region. The NAT safety policy is enhanced by the agreement of member States to use the information shared at NAT SOG meetings for the purposes of education and for making safety improvements within the Region. This has paved the way for members to discuss and share information and act upon it within the framework of the NAT SPG.

Safety Performance Monitoring and Measurment

Collision Risk Estimates

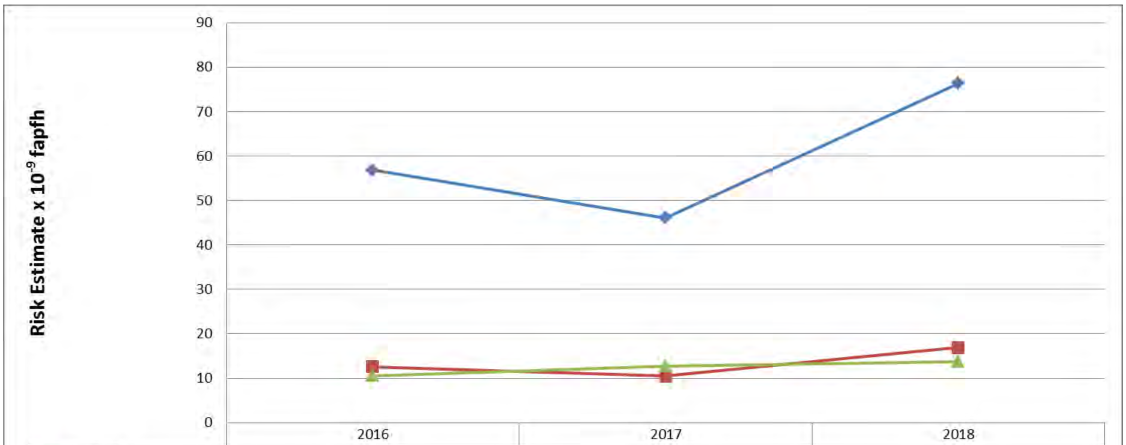
The estimated risk of a mid-air collision, referred to as Collision Risk Estimate (CRE), is reported in terms of fatal accidents per flight-hour (fapfh) and is calculated in the lateral and vertical planes. The model used for computation essentially assumes each aircraft is a box having a fixed x, y, and z orientation and approximates the risk of collision by integrating the crossing rate over the period when two boxes are close to each other in each dimension.

Estimates of Vertical and Lateral Collision Risk for 2018 in the NAT HLA are based on risk bearing events reported to the NAT Central Monitoring Agency (CMA) for the period January to December 2018. Flight activity data from five NAT Oceanic Control Areas (OCAs) was used in deriving an estimate of Vertical and Lateral Collision Risk. The risk estimates were calculated for the Middle zone (Gander and Shanwick OCAs), the North zone (the Reykjavik OCA), and the South zone (the New York East and Santa Maria OCAs) and then combined to derive a risk estimate for NAT HLA.

The Vertical Collision Risk Estimate for 2018 was estimated to be 76.4 x 10^{-9} fapfh for all NAT HLA. Figure 2 shows that this reduces by 78% to 16.9 x 10^{-9} fapfh with SLOP. The Vertical Collision Risk Estimates in 2018 both with the SLOP effect incorporated and without SLOP are higher in comparison to 2017 estimates.

Figure 2 also presents the Lateral Collision Risk for the year 2018, estimated to be 13.8 x 10^{-9} fapfh, which represents an increase of 8% compared to 2017.

The increase in risk is in part due to a long duration event (52 minutes) which counted in both the vertical and lateral dimensions.



	2016	2017	2018
Vertical CRE	56.8	46.1	76.4
Vertical CRE (with SLOP)	12.6	10.5	16.9
Lateral CRE	10.6	12.8	13.8

Figure 2 - Collision Risk Estimates in the NAT HLA (2016-2018)

Safety Key Performance Indicators (KPIs)

The NAT SPG has established Safety KPIs and associated targets for the NAT HLA. The NAT HLA performance in 2018 is shown the table below[1]. The 2018 figures are shown in green where the performance meets the targets and red otherwise. For those where the information was not available to calculate the baseline, these are left in black.

Safety KPI		Target		2017 Performance	2018 Performance
i	Number of accidents	0		0	**0**
ii	Number of fatal accidents	0		0	**0**
iii	Number of fatalities related to aviation fatal accidents	0		0	**0**
		Target	**Previous rolling three-year period of performance (2015-2016-2017)**	**2017 Performance**	**2018 Performance**
iv	Rate of LHD events (No of LHD events divided by No of flight hours flown in the NAT region), involving operations with Data Link in use	Reduction over previous rolling three-year period of performance	2.46×10^{-5}	2.67×10^{-5}	**2.87×10^{-5}**
v	Rate of LHD events (No of LHD events divided by No of flight hours flown in the NAT region), involving operations with Data Link not in use	Reduction over previous rolling three-year period of performance	1.36×10^{-5}	1.20×10^{-5}	**7.18×10^{-6}**
vi	Percent of Long Duration[2] LHD events	Reduction over previous rolling three-year period of performance	3.88%	0.00%	**2.67%**
vii	Rate of minutes that aircraft, with Data Link in use, spent at the wrong flight level (Amount of minutes spent at the wrong flight level divided by total duration of flights in minutes)	Reduction over previous rolling three-year period of performance	6.63×10^{-7}	8.63×10^{-7}	**6.95×10^{-7}**
viii	Rate of minutes that aircraft, with Data Link not in use, spent at the wrong flight level (Amount of minutes spent at the wrong flight level divided by total duration of flights in minutes)	Reduction over previous rolling three-year period of performance	1.48×10^{-6}	4.91×10^{-7}	**1.05×10^{-6}**

[1] The flight hours flown value for 2018 calculations use the actual flight hours, whereas, for the previous years, the figures were calculated using the estimated flight hours of 3.25 hours per aircraft

[2] Long Duration LHD event means an event unprotected by ATC for 20 minutes or more, based on a threshold established after review of historical data reported to the NAT CMA

ix	Rate of GNE events (No of GNE events divided by No of flight hours flown in the NAT region) , involving operations with Data Link in use	Reduction over previous rolling three-year period of performance	N/A[3]	6.54 x 10^{-6}	1.72 x 10^{-5}
x	Rate of GNE events (No of GNE events divided by No of flight hours flown in the NAT region), involving operations with Data Link not in use	Reduction over previous rolling three-year period of performance	N/A[3]	5.45 x 10^{-6}	4.79 x 10^{-6}
xi	Rate of losses of separation (vertical) (No of losses of separation events divided by No of flight hours flown in the NAT region)	Reduction over previous rolling three-year period of performance	1.13 x 10^{-5}	1.14 x 10^{-5}	**9.58 x 10^{-6}**
xii	Rates of losses of separation (lateral) (No of losses of separation events divided by No of flight hours flown in the NAT region)	Reduction over previous rolling three-year period of performance	N/A[3]	4.91 x 10^{-6}	3.83 x 10^{-6}

Scrutiny of events

The NAT SG reviewed and scrutinized a total of 263 events occurring in the NAT High Level Airspace (HLA) of the Oceanic Control Area (OCA) of Shanwick, Santa Maria, Reykjavik, New York East, Gander and Bodo during the year 2018. These events were categorized as follows:

- 85 Large Height Deviations (LHDs)
- 96 actual lateral deviations, including:
  - 47 GNEs and
  - 34 ATC Interventions where when the Air Traffic Controller (ATCO) caught and corrected a lateral deviation before it developed into a GNE
- 82 prevented events where the ATCO prevented a deviation or an uncoordinated flight profile entering the airspace of another ANSP.

It is worth noting that ATC interventions and preventions are positive indicators that the ATC system has recognized an error, often through data link equipage capabilities, warning the controllers in sufficient time to take pre-emptive action. Underlying causes of all lateral deviations (incipient or actual) are often identical – the magnitude depends upon the timeliness of identification and corrective action. The scrutiny of these 263 events of 2018 showed that the top 5 contributing issues were:

3 For Safety KPIs in the lateral dimension, it is not appropriate to calculate values for 2015 and 2016 due to changes in methodology and data capture, therefore, there is no baseline for the lateral SKPIs.

1. *Flight Plan vs. Clearance* where flying, or intending to fly the planned route instead of the cleared route contributed in 53 (20%) of the events of 2018. In most cases (31 out of the 53), deviations did not actually occur as they were prevented by an ATCO.

2. *ATC coordination* where an error occurring during the coordination between two ATC sectors or ANSPs contributed in 38 (14%) of the events of 2018. In almost half of those cases, deviations did not actually occur as they were prevented by an ATCO.

3. *Waypoint updating* involving waypoint entry or deletion errors by flight crews contributed to 37 (14%) of the events of 2018.

4. *Equipment*, where the failure/malfunction of a ground-based, airborne, Data-Link or other equipment contributed in 35 (13%) of the events of 2018. This contributing issue affected equally LHDs and lateral deviations.

5. *Non-adherences to ATC clearances* in either the vertical or the lateral dimension contributed to 25 (10%) of the 2018 events.

Additional contributing issues were newly identified during the scrutiny of the 2018 deviations. One is related to the issuance of CPDLC uplink messages where pilots, upon receiving UM79/UM80/UM83 messages, erroneously route directly to the point displayed in the message. This issue could be related to how the messages are displayed to the crew. This contributed to 10 (4%) of the 2018 deviations. Another new contributing issue identified in 2018 is related to pertinent message not actioned by ATC, where a message that could have been useful to prevent or mitigate a deviation was presented to the ATCO, but not actioned, sometimes because it was perceived as a nuisance message that could be disregarded. This contributed to 24 (9%) of the 2018 deviations.

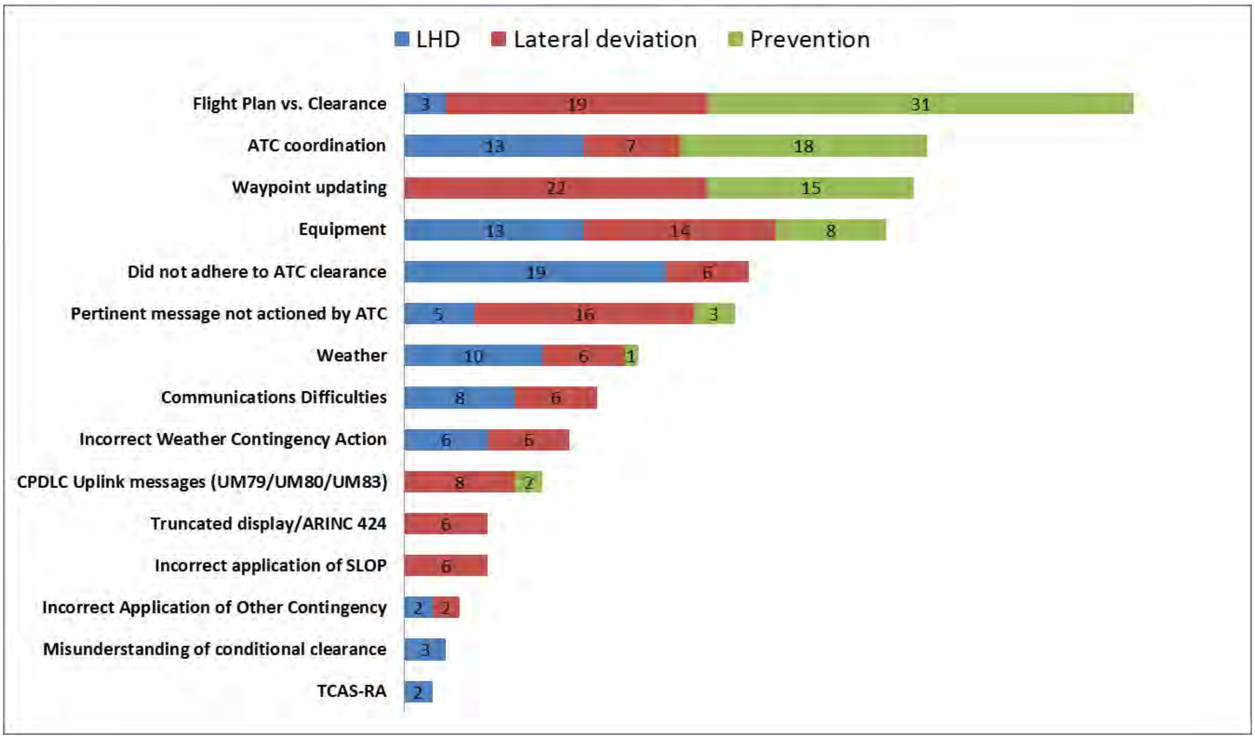


Figure 3: Contributing issues to events in the NAT HLA in 2018 reported to NAT CMA and scrutinized by NAT SG

Prevented deviation events and ATC Interventions events were classified according to the implemented mitigations used to avert a deviation. The results of this classification are presented in Figure 4, demonstrating that the practice of requiring position reporting of “NEXT and NEXT +1” and the “CONFIRM ASSIGNED ROUTE” CPDLC message sets (UM137/DM40) are proving to be of benefit.

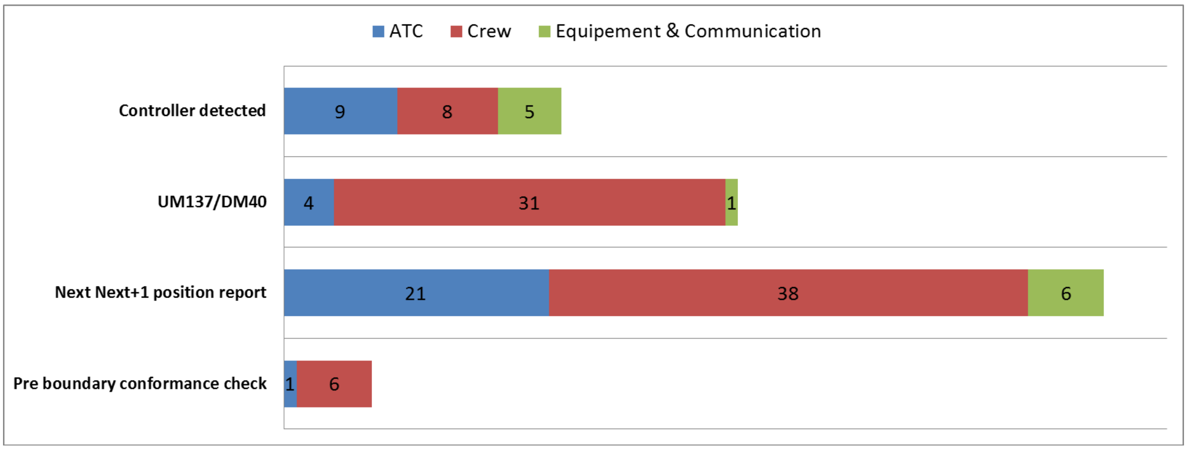


Figure 4: Mitigations used for prevented lateral deviations and ATC interventions in 2018

In addition, 22 LHDs in 2018 could have potentially been prevented through the use of Selected Flight Level-Cleared Flight Level (SFL-CFL) Conformance Checking via Space-Based ADS-B.

The following high-level human error types were used to record the contribution of human factors in each deviation and prevention in 2018. An error is defined as “an action or inaction by an operational person that leads to deviations from organizational or the operational person’s intentions or expectations”. The following error types are applicable to all aviation personnel (flight crew, ATC, dispatchers…).

Error Type	**When the operational person…**
Action	Made a selection error Made a timing/positioning error Omitted a required action Transmitted, recorded or entered unclear or incorrect information Did not transmit or record required information
Workload management	Was unable to or did not adequately prioritize, schedule, initiate, execute, monitor, and terminate multiple concurrent tasks
Non conformance	Intentionally deviated from established regulations, procedures, norms or practices. *<u>Note</u>: intentional acts are not always acts of malicious intent and should not automatically result in disciplinary measures. Individuals may knowingly deviate from norms, in the belief that the violation facilitates mission achievement without creating adverse consequences.*
Perception	Mis-saw or did not see visual information Mis-heard or did not hear auditory information Misunderstood visual information/auditory information, resulting in an

Error Type	When the operational person…
Decision making	Misjudged aircraft/object projection Made an incorrect or insufficient decision or plan Made a late decision or plan
Memory	Forgot previous action Forgot planned action Had no or inaccurate recall of temporary information Misrecalled or had no recall of information in long-term memory

The scrutiny of the 2018 events in the NAT HLA shows a predominance of action and of perception error types, which can help in determining what type of mitigation measures to establish and implement to mitigate the type of errors and their effects on deviations in NAT HLA.

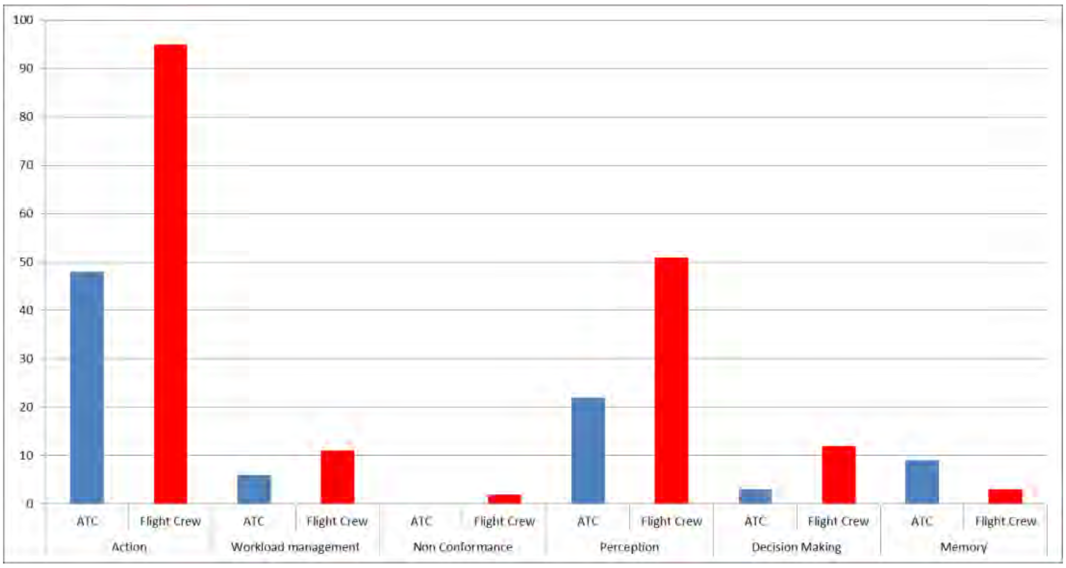


Figure 5: Contribution of Human Error for events in the NAT HLA for January-December 2018

NAT Regional Priorities

A number of Air Navigation Service (ANS) initiatives are on-going in the NAT Region. In line with the safety policy and as stipulated in the terms of reference and the work structure of the NAT SPG, it is imperative that acceptable safety arguments are provided in relation to system developments in the NAT Region. The agreed policy is as stated above, to maintain and where possible improve the agreed safety standards in all activities. In this regard, the safety work that provides confidence that upcoming initiatives do not negatively affect the safety of the ICAO NAT Region, is ongoing.

Space-based ADS-B

In 2018, the NAT Region spent considerable resources to prepare to the trial implementation of Space Based ADS-B in support of separation minima using ATS surveillance where VHF voice communication is not available. SB ADS-B enables a breakthrough in the overall NAT concept of operations by providing radar-like ATS surveillance in the areas where such surveillance was not feasible in the past. It brings safety and efficiency gains in ATM and also Search and Rescue by allowing surveillance capability of any ADS-B transponder equipped aircraft. The trial, which has started in March 2019, was preceded by extensive work on developing and coordinating the trial concept of operations, an implementation plan and a task list, and associated safety cases. Prior to that, the NAT Region also had completed a Business Case Assessment (BCA) that indicated that implementing the reduced oceanic separation standards based on SB ADS-B in the NAT would represent a positive business case. Furthermore, there are potential benefits in terms of significant reduction in tactical conflicts to be gained through SB ADS-B implementation. The trial will continue until November 2020 when the related Procedures for Air Navigation Services - Air Traffic Management (PANS-ATM, Doc 4444) provisions on ATS surveillance separation in the areas without VHF communications become applicable. The trial is initially conducted in the longitudinal dimension, to be further expanded to the lateral, once all preparatory safety and planning work has been completed and approved by the NAT SPG.

Separation minima based on PBCS/PBN

On 29 March 2018, the NAT Region implemented the separation minima based on PBCS/PBN, initially on 3 core tracks within the Organised Track System (OTS). The implementation was preceded with work on preparing the concept of operations, implementation plan and task list as well as safety documentation. Two parallel trials were run, reduced lateral and longitudinal separation minima implementation, to gain sufficient confidence and support the global work on the development of Annex 6, Annex 11, Annex 15 and PANS-ATM provisions to enable a globally harmonised implementation. The NAT implementation programme was closely coordinated with the APAC Region. The reduced separation minima bring additional efficiency and safety benefits. This is also an operational improvement that contributes to ICAO's strategic objective of reducing the environmental impact of civil aviation through providing more capacity and efficient trajectories. The PBCS and PBN component of this implementation provides safety assurances that the air and ground systems, on which the application of the reduced separation minima is dependent, are performing in accordance with the expected performance levels. This also enables a monitoring system to be in place, based on collaboration with the global network of regional monitoring agencies, to follow up on non-performing fleets and continuously improve the data link performance.

Conclusion

The NAT Region continues to make progress toward achieving its safety targets, although LHDs and vertical risk continue to be of specific concern. At the same time, the Region also continues to conduct the safety analyses and operational trials necessary to introduce new technologies and procedures intended to increase the efficiency of the busy oceanic airspace.

Appendix A

ADS-B	Automatic Dependent Surveillance - Broadcast
ADS-C	Automatic Dependent Surveillance – Contract
ANS	Air Navigation Service
ATC	Air Traffic Control
ATS	Air Traffic Service
CPDLC	Controller-pilot data link communications (data link)
DLM	Data Link Mandate
EFFG	Economic, Financial and Forecast Group
fapfh	Fatal Accidents per Flight Hour
GASP	Global Aviation Safety Plan
GNE	Gross Navigation Error
HLA	High Level Airspace
ICAO	International Civil Aviation Organization
KPI	Key Performance Indicator
LD LHD	Long Duration LHD
LHD	Large Height Deviation
MNPS	Minimum Navigation Performance Specification
NAT	North Atlantic
NAT CMA	North Atlantic Central Monitoring Agency
NAT EFFG	North Atlantic Economic, Financial and Forecast Group
NAT MWG	North Atlantic Mathematicians Working Group
NAT SG	North Atlantic Scrutiny Group
NAT SOG	North Atlantic Safety Oversight Group
NAT SPG	North Atlantic Systems Planning Group
OCA	Oceanic Control Area
OTS	Oceanic Track System
RVSM	Reduced Vertical Separation Minimum
SLOP	Strategic Lateral Offset Procedure
TLS	Target Level of Safety

APPENDIX M — NAT TRAFFIC FORECAST

(*paragraph 4.1.3 refers*)

1. INTRODUCTION

1.1 BACKGROUND ON NORTH ATLANTIC FORECAST

In the past, the NAT traffic forecast was unconstrained and driven by economic variables and forecasts. The results of the unconstrained forecast produced a traffic growth forecast that was unbounded, while most major European airports, and a few U.S. international airports have slots or scheduling limits. In addition, the ten different route group forecasts did not provide explicit forecasts for the seven Flight Information Regions (FIR) in the North Atlantic. Also noteworthy, the forecast only had a two-year update cycle and did not capture variations in the business cycles. To address these issues with the NAT traffic forecast, the new forecast methodology recognizes that the number of air carrier operations over the next several years has already been determined by air carrier fleet planning. Any carrier's key strategic activity involves projecting the expected demand for travel in different markets in both the geographical and consumer sense, determining which of those identified markets the carrier will attempt to serve, and what type of aircraft fleet it will use to serve those markets. Air carriers then match the identified markets opportunities to their existing capacity, enter into binding agreements to either acquire the needed aircraft and crew, or enter into contractual agreements through joint ventures with partner airlines. These agreements typically cannot be discharged absent bankruptcy or some other force majeure event.

The previous forecasting methodology relied on economic models of passenger demand, aircraft gauge, load factors, etc. In contrast, this new forecast methodology relies on the decisions already made by the air carriers of how the markets should be served. In addition, most economic forecasting methodologies rely on generic fleet assumptions which do not reflect the various business models that different carriers may be pursuing. The new methodology reflects airline business models as they are the foundation for the fleet plans developed by the individual carriers. A key limitation of this approach, however, is how far in advance airlines plan their fleets. Therefore, the projection is segmented at the five-year forecast horizon. Beyond five years, a macroeconomic based forecast is used. The macroeconomic forecast is a composite of forecasts from different sources including ICAO, Boeing and Airbus, defining low, medium and high growth forecasts beyond the five-year point.

1.2 SUBJECT

The NAT forecast methodology is implemented in two phases:

- Phase 1 – The near-term forecast (first five years) is based on detailed projections for individual carriers, each of which is based on publicly available information about their individual fleet and network plans. Sources include public announcements (press releases and investment community presentations and discussions), official financial statements, and news reports. The current collection of 44 individual carriers includes only scheduled commercial passenger airlines and makes up about 80 percent of the total NAT scheduled traffic. The selected 44 carriers include the largest operators, fastest growing carriers, low-cost carriers (LCC) and other carriers of special interest, like the group of Middle East carriers. The remainder of the traffic is assumed to remain constant and categorized as "other". In a previous release of the forecast, the total count of specifically analysed carriers was 45. Thompson Air is now excluded because of irregular reporting due to it flying scheduled and unscheduled charter flights. However, Thompson Air scheduled flights are included in the "other" category
- Phase 2 – the long-term forecast uses the end of the near-term forecast as its starting point and uses a macroeconomic forecast to determine low, baseline, and high growth rates. The macroeconomic forecast is a composite of forecasts from different sources including IATA, ICAO (FESG CAEP), Boeing and Airbus, defining low, medium and high growth forecasts beyond the five-year point.

1.3 PURPOSE

The purpose of this forecast is to help the North Atlantic Air Navigation Service Providers (ANSP) and other stakeholders develop traffic growth expectations for the NAT. This is particularly important for the ANSPs because they use the traffic forecast to set rates or route charges and staffing requirements. In addition, this forecast will help support analysis related to NAT region operational requirements and mandates.

2. METHODS AND ASSUMPTIONS

2.1 SCOPE

Geographic Scope

As described in the Summary of Discussions of the North Atlantic Economic, Financial and Forecast Group Traffic Forecast Workshop (Lisbon, Portugal, 25 February to 26 February 2016), this work currently addresses the forecast requirements for seven of the North Atlantic flight information regions (FIR), Shanwick, Gander, Santa Maria, New York, Reykjavik, Bodo, and Nuuk (formerly Sondrestrom).

Carriers Identified for Individual Analysis

For the purpose of the analysis, the following individual carriers were identified of particular interest:

Table 1: Select airlines for which individual NAT forecasts are developed.

Delta Airlines	Ryan Air	TAP Portugal
United Airlines	Turkish Air	Avianca
American Airlines	Air Berlin	Aeroflot
British Airways	Scandinavian Airlines	Polish Airlines
Icelandair*	Swiss Air	EasyJet
Air Canada*	~~Thompson~~	SATA International
Lufthansa	Thomas Cook Airlines	Air India
Air France	Condor	Royal Air Maroc
Virgin Atlantic	Norwegian Air*	Air Greenland
KLM	Alitalia	Qatar Airways
Aer Lingus	Air Europa	Finnair
Air Transat	Jet2	Atlantic Airways
Iberia Airlines	Etihad Air	TAM Airlines
United Emirates	WestJet	jetBlue
WOW Air	Air Caraibes	Southwest Airlines
*Air Canada is combined with Rouge; Icelandair is combined with Air Iceland; Norwegian Air is a combination of Norwegian Air Shuttle and Norwegian Air International ^Thompson Air removed from the list of carriers whose fleet plans were analyzed in detail		

These carriers have been identified as being in one or more of the following categories: Middle East, LCC, fastest growing, large legacy, or are of particular interest to at least one ANSP. To support the NAT forecast, individual NAT forecasts are developed for each of these carriers, which represent more than 80 percent of the total scheduled NAT air traffic. The remaining 20 percent of the scheduled NAT air traffic is made up of flights operated by smaller carriers.

2.2 DATA SOURCES

Scheduled data

To develop a baseline for the analysis, scheduled flight data is acquired from FlightGlobal/INNOVATA for one week in each year. The representative week was selected to be from July 15 to July 21 for 2014 – 2018. The scheduled data is processed through a trajectory model to extract only city-pairs with flights that would traverse through NAT airspace based on a great circle distance flight path. This assures that all flights that flew through the NAT are counted regardless of wind variations and other unpredictable factors. Generating a baseline through this method allows consistency between successive forecasts.

ANSP provided historic data

To determine the traffic within individual FIRs, each of the participating ANSPs have provided actual flown data for air traffic that traversed their particular NAT FIR for the same week the schedule data covered. The following table lists the participating NAT FIRs that are currently included in the forecast and the ANSPs that support them:

Table 2: FIRs and corresponding ANSP

FIR	ANSP
Gander	Nav Canada
New York	FAA
Reykjavik	Isavia
Santa Maria	NAV Portugal
Shanwick	IAA and NATS
Bodo	Avinor
Nuuk (Sondrestrom)	Isavia

EUROCONTROL also provided flight data for various FIRs, which was extremely useful for crosschecking between data sets. The data sets provided by the ANSPs included the following fields for each of their respective FIRs for the historic data for the representative week for each year including 2013 - 2017:

Table 3: Historic Data Fields

Year: 2013 - 2017	ANSP Name
FIR Name	Flight Call Sign
Carrier three letter ICAO code	Aircraft type (later standardized across reported data sets)
Tail Number	Flight type: Passenger, Cargo, Private
Departure Date (Z)	Departure time (Z)
Departure Airport	Departure Country
Arrival Airport	Arrival Country
Arrival Date (Z)	Arrival Time (Z)
Carrier Name	

FIR data representing 2018 operations was not incorporated into the preliminary forecast. The data will be updated for the final forecast to be released in spring 2019. In addition, flights history specifically associated with Nuuk FIR flight data was not available so city-pair routes are assigned to Nuuk based on great circle path.

Fleet Data

Fleet data and fleet plan information was collected from various public sources, including individual carrier web sites, financial reports, manufacturer order books, and crowd source websites like planespotters.net. A fleet forecast is updated every forecast, however, the fleet forecast for the final 2018-2023 forecast is the same used in the 2017-2022 forecast. As a result, the fleet projected for 2022 is the same for 2023. This returns a growth rate of 0% from 2022 to 2023.

Forecasts for Categories of Special Interest

The FAA commissioned two separate studies to support forecasts for two categories of carriers of special interest. The two categories are LCCs that are flying or are expected to begin flying transatlantic operations, and the Middle East carriers. For each of these two cases, GRA Incorporated, a strategic and economic consulting firm with expertise in the global aviation industry, provided a comprehensive analysis. Their forecasts are incorporated in this work and a copy of their work is attached as a separate file.

2.3 KEY ASSUMPTIONS

The forecast is based on a few key assumptions. First, this methodology assumes that airline fleet plans are relatively fixed for the near future, out to approximately five years. This assumption is based on the observation that airlines are bound by contractual obligations from which they can be released only under special circumstances, like bankruptcy or by mutual agreement with the other parties. These contracts include aircraft purchase and lease agreements, and capacity purchase agreements with regional carriers. There are both upside and downside risks to this assumption. On the downside, carriers may reject these agreements in bankruptcy, as has happened with most of the major U.S. carriers in the past decade. On the upside, carriers have the ability to opportunistically acquire aircraft when demand warrants. In practice, relatively few aircraft have been removed during the industry's recent bankruptcies, while the upside risk often involves transferring assets between carriers, rather than adding new aircraft to the system. (The transfer of Boeing 717s from Southwest to Delta is an example of the latter effect [Mutzabaugh, 2013b].)

A second key assumption is that the mission profile for a particular aircraft type does not change over time. For example, in 2015 Air France's 747s had an average stage length of 7,000 kilometres and utilization of 12 departures per week. The forecast methodology assumes that the mission profile of a particular aircraft type will continue to be the same through the next five years. In general, all aircraft in the forecast are considered to be trans-oceanic capable; however, some aircraft types have shorter ranges than others. For example, the single aisle aircraft, such as the A321 neo, generally have relatively shorter range than the twin aisle aircraft. Therefore, the single aisle aircraft are expected to be deployed on routes that connect points relatively near the coastline on opposite sides of the Atlantic, while the longer-range capable aircraft do not have this restriction. A related assumption is that if a new aircraft type is added to a carrier's fleet, this type will have a similar mission profile as comparable existing aircraft, unless the carrier specifies a strategic purpose for the new aircraft type. For example, Delta's new A350-900s are assumed to have approximately the same mission profile as the 777s which Delta has had in its fleet for many previous years.

A third assumption is that the forecast beyond five years is not dependent on a detailed fleet forecast. The fleet assumptions apply primarily to the first five years of the forecast. Because carrier fleet plans become far less firm beyond the first five years, a higher-level macroeconomic approach is used for year six and beyond.

3. METHODOLOGY FOR NEAR-TERM NAT FORECAST

Once the carriers' fleet plans are determined for the select set of carriers, the mission profiles for each aircraft type are used to calculate the number of weekly transatlantic flights that are planned for the each aircraft in that fleet. In this analysis, we call the weekly transatlantic flight count the carrier's utilization rate for that fleet type. The utilization rate tells how many times a single aircraft of this fleet type for a particular carrier will fly a transatlantic mission. The purpose of the utilization rate is to recognize that carriers can assign aircraft to multiple missions, and count only the operations that traverse the North Atlantic. The utilization rates are based on each carrier's historic operational trends as determined by matching fleet data with the published flight schedules.

The utilization rates are applied to the carrier future fleet plans to project the total number of North Atlantic operations for each carrier. If additional carrier specific information is available, the utilization rates can be manually adjusted to better reflect those strategic plans (e.g., if a carrier announces a new strategy for its current or future fleet). This provides a standardized way to project North Atlantic activity for each carrier by fleet. The product of the fleet counts and utilization rates gives the total number of flights.

Once the total number of NAT flights for each carrier is determined, the next step is to distribute them among the carrier's NAT network. This is done manually by first selecting the top 25 city-pairs operated by each NAT carrier. The remaining city-pairs are grouped into the "Other" category. This approach focuses on the routes responsible for most of the traffic in the NAT. New routes, not yet in operation, are also added for select carriers such as Norwegian Air whose trans-Atlantic operations are anticipated to grow. Through the use of historical trend analysis and information from public announcements by the carriers, flights are added (or removed) to (from) the baseline year as a total number of flights or a percentage of the base year. A process flow of the methodology is shown in Figure 1.

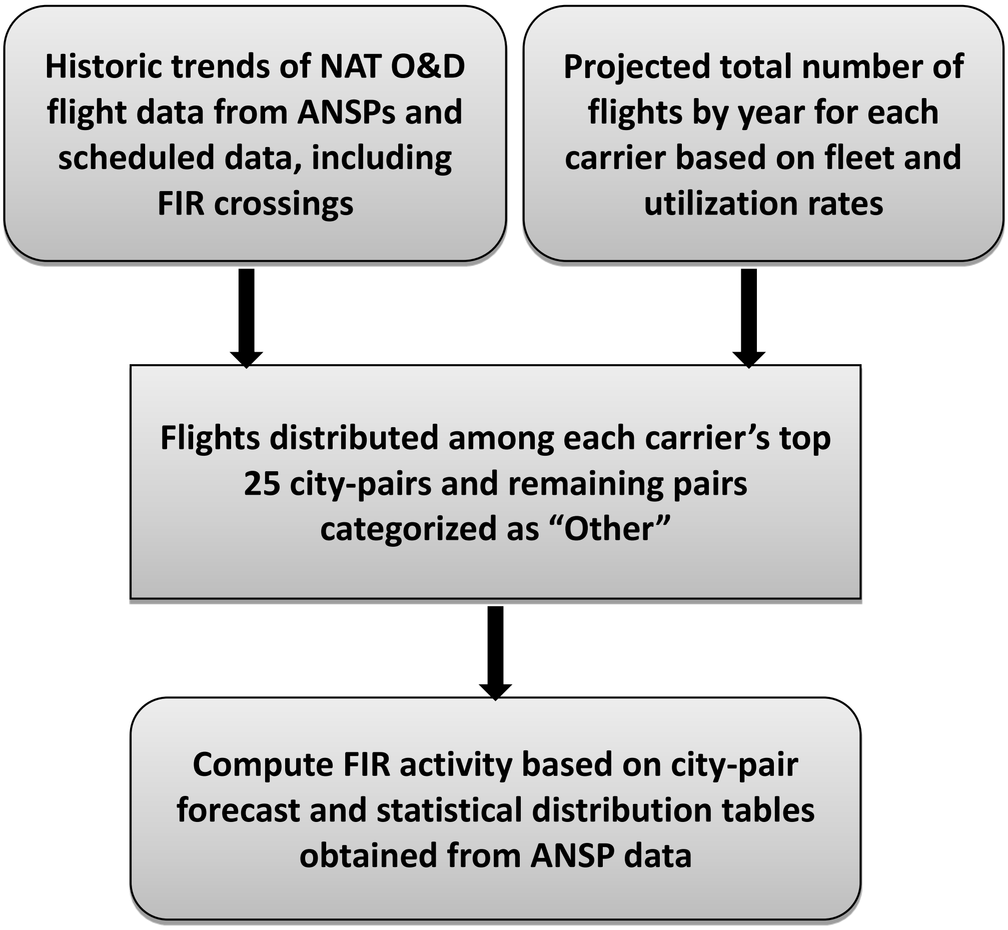


Figure 1: NAT Near-Term Forecast Process Diagram

To complete the near-term forecast, the baseline level of activity for all other carriers is added to the projection for the select set of carriers developed using the fleet and market analysis described above. These flights make up the remaining 20 percent of the total number of scheduled NAT flights. If a particular carrier in this group becomes of interest, it can be removed from the general group and incorporated into the group of carriers with individual forecast without disrupting the continuity of successive forecasts. Unscheduled flights are not included because their irregularity would introduce an increased level of uncertainty to the forecast. Such irregular flights include helicopters, charter flights, cargo, and military flights. We recognize cargo is an important part of NAT activity but primarily in terms of tonnage because total cargo flights do not contribute significantly to overall NAT traffic.

4. NEAR-TERM FORECAST RESULTS

The final forecast results show 14.3 percent growth in the number of NAT flights between 2018 and 2023. Table 4 below shows the baseline data for 2018 according to published schedules with the projected number of flights for 2023. The far right column is the carrier's rank based on the number of flights added to the system.

Table 4: Final NAT Five-Year Forecast by Carrier

		HISTORICAL					FORECAST					
Carrier Name	**Carrier**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Rank Order by Growth**
Delta Airlines	DAL	1,097	1,180	1,210	1,238	1,224	1,253	1,339	1,376	1,401	1,401	2
United Airlines	UAL	1,080	1,134	1,132	1,094	1,094	1,094	1,124	1,204	1,269	1,269	3
American Airlines	AAL	970	954	940	940	954	943	1,020	1,031	1,109	1,109	4
British Airways	BAW	868	859	861	868	908	911	909	914	914	914	33
Air Canada	ACA	497	572	668	716	790	815	881	917	919	919	6
Icelandair	ICE	515	577	728	764	754	762	826	850	862	862	9
Lufthansa	DLH	601	604	629	635	660	660	659	659	665	665	35
Air France	AFR	526	527	532	539	545	592	646	681	681	681	5
WOW Air	WOW	108	146	234	368	466	141	0	0	0	0	44
Virgin Atlantic	VIR	306	366	368	364	382	434	461	450	450	450	13
Aer Lingus	EIN	234	268	295	334	370	384	383	383	383	383	28
Norwegian Air	NAX	92	100	134	268	351	451	622	752	913	913	1
KLM	KLM	292	295	305	313	332	316	363	363	391	391	14
Air Transat	TSC	273	270	276	290	308	308	308	308	308	308	36
Iberia Airlines	IBE	191	214	243	254	274	274	274	274	322	322	16
Ryan Air	RYR	214	214	226	274	268	274	311	396	396	396	7
United Emirates	UAE	153	201	249	225	221	243	288	331	331	331	8
Qatar Airways	QTR	109	115	180	185	187	193	193	219	240	240	15
Scandinavian Airlines	SAS	126	142	176	188	178	182	167	141	172	172	43
Turkish Air	THY	130	146	191	175	176	176	176	176	176	176	36
Swiss Air	SWR	150	162	176	162	162	159	157	157	157	157	42
Thomas Cook Airlines	TCX	79	95	153	167	161	161	161	161	161	161	36
Condor	CFG	115	131	137	159	151	160	160	160	160	160	30
Alitalia	AZA	122	126	132	144	140	140	140	140	140	140	36
Jet2	EXS	80	78	104	114	124	135	158	168	162	162	18
Air Europa	AEA	80	90	104	128	115	142	126	188	188	188	11
WestJet	WJA	22	36	96	96	110	108	148	177	181	181	12
Polish Airlines	LOT	60	60	64	78	98	120	122	134	134	134	19
Air Caraibes	FWI	62	64	76	89	97	97	127	127	127	127	21
Avianca	AVA	54	70	70	84	88	94	99	111	111	111	23
TAP Portugal	TAP	47	41	72	82	84	103	108	118	118	118	20
Aeroflot	AFL	72	62	66	82	80	92	98	108	108	108	22
Etihad Air	ETD	76	96	96	97	79	110	129	162	162	162	10
EasyJet	EZY	46	66	64	62	58	76	92	105	105	105	17
SATA International	RZO	52	48	50	67	54	49	54	69	69	69	26
Air India	AIC	42	42	42	51	54	60	60	62	62	62	31
Royal Air Maroc	RAM	38	32	40	48	50	50	56	64	68	68	24
Finnair	FIN	20	26	30	40	46	52	56	56	56	56	29
jetBlue	JBU	28	28	36	38	40	40	40	40	46	46	32
Air Greenland	GRL	32	28	32	36	38	43	43	43	43	43	34
Atlantic Airways	FLI	18	16	24	24	22	22	22	22	22	22	36
TAM Airlines	TAM	32	28	28	18	8	15	20	22	25	25	25
Air Berlin	BER	134	140	178	208	0	0	0	0	0	0	36
Southwest Airlines	SWA	0	0	0	0	0	0	0	0	13	13	27
Scheduled Others	Oth	1,116	1,063	1,341	1,483	1,802	1,802	1,802	1,802	1,802	1,802	
Total		**10,959**	**11,512**	**12,788**	**13,589**	**14,103**	**14,233**	**14,928**	**15,618**	**16,118**	**16,118**	
Yr-Yr %Change			**5.0%**	**11.1%**	**6.3%**	**3.8%**	**0.9%**	**4.9%**	**4.6%**	**3.2%**	**0.0%**	
5-Year %Change		**14.3% Total 5-Yr Growth**										
5-year Yr-Yr %Change		**2.7% Avg Yr-Yr Growth**										

Figure 2 shows FIR peak-week traffic trends by FIR. Traffic volumes at Gander and Shanwick are at similarly high levels compared to the traffic volumes at the other FIRs. This is intuitively consistent, since some of the highest frequency NAT markets pass through these two FIRs, including most of the traffic between North America and Western Europe, including the highest frequency market John F. Kennedy Airport (JFK)-London Heathrow (LHR).

Note that the total forecast for the NAT does not equal to the sum of the forecasts of each the individual FIRs. Because of the way the North Atlantic is partitioned into FIRs, most NAT flights traverse more than a single FIR. Summing the flights from all FIRs would result in counting single flights more than once. The total NAT forecast is determined by summing the market-level forecasts for each year.

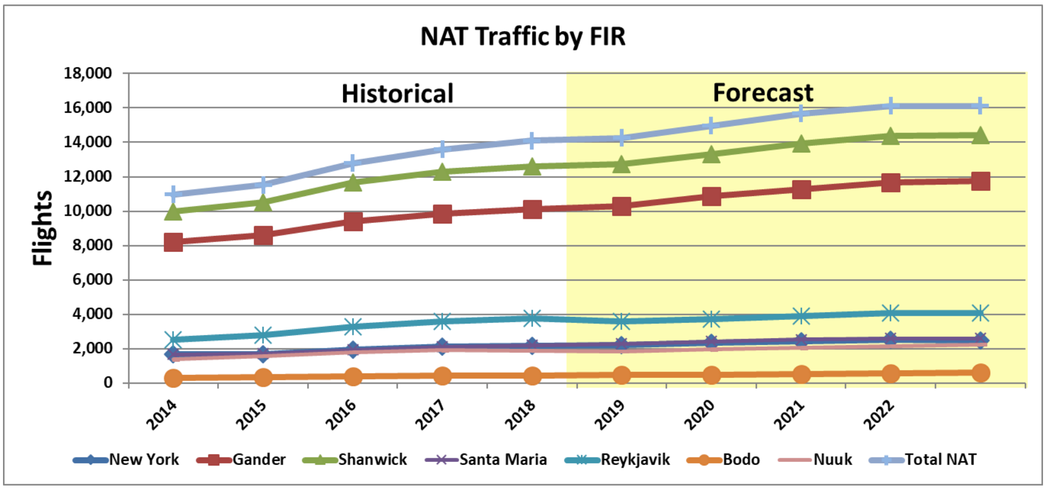


Figure 2: NAT Peak Week Traffic Trends by FIR

Table 5: Preliminary NAT Five-Year Forecast by Carrier and FIR

Average Yearly Growth Rates by FIR		
FIR	2014 – 2018 (actual growth rate)	5-Yr Projected
New York	6.7%	3.1%
Gander	5.4%	3.1%
Shanwick	6.0%	2.7%
Santa Maria	7.1%	3.5%
Reykjavik	10.6%	1.6%
Bodo	10.0%	6.5%
Nuuk	8.0%	3.7%
Total NAT	6.5%	2.7%

Table 5 lists the annual historic growth rate from 2014 to 2018 along with the five-year (2018-2023) average annual forecast growth rates. The growth rates in the forecast are supported by the publicly accessible fleet information for 44 identified carriers. Note that while the percentage growth rates for Shanwick and Gander are lower than for some other NAT FIRs, Shanwick and Gander total traffic is by far larger than the other FIRs. Growth of Reykjavik was considerably impacted by the bankruptcy of Wow air this year. The percentage growth rates for Bodo, and Nuuk are higher, although over a lower base.

More detailed and complete forecast results are posted at ICAO's secure portal (**https://portal.icao.int/NATEFFG**).

5. METHODOLOGY FOR LONG-TERM NAT FORECAST

Once the near-term forecast is established, the long-term forecast (beyond the first 5 years) is based on the long-term forecast beyond 2023 is expected to be in the range of 1.94 percent to 3.3 percent, consistent with the combined passenger traffic growth rate forecast from an updated IATA forecast, a 2017 ICAO working paper, Airbus forecast, and Boeing forecast.

Since there is less certainty in the long-term forecast, the long-term forecast is not expanded to the detailed market and carrier levels as in the near-term forecast. Instead, the long-term forecast growth rates are applied to the end points of the aggregate traffic numbers at the FIR level to determine the FIR long-term growth projections beyond the short-term forecast.

Table 6: Long-term North Atlantic Passenger Growth Forecasts (*Assembly 39th session-economic commission working paper)

Sources	CAGR from 2017 to 2036	CAGR from 2012 to 2032	CAGR from 2012 to 2042	CAGR from 2022 to 2036
IATA				1.94%
Boeing	2.9%			
Airbus	2.9%			
ICAO High*		3.3%	3.3%	
ICAO Central*		3.1%	2.9%	
ICAO Low*		2.8%	2.7%	

Table 7: Summary of North Atlantic Passenger Growth Forecasts

Summary of Long-Range (2022-2037) North Atlantic Passenger Growth Forecast	
High	3.30%
Central	2.90%
Low	1.94%

Tables 6 and 7 provide long-term passenger growth forecasts. Table 6 shows specific forecasts by source and their respective forecast periods. Table 7 summarizes the results from Table 6 to provide High, Central and Low growth rate forecasts, which correspond to the maximum, median, and minimum growth rates presented in Table 6, respectively.

The forecasts in Table 6 do not all reference the same base year, nor do they all reference the same end-point to define their growth forecasts; however, since these forecasts project far into the future (referencing 2010 to 2020 as a starting point and 2030 to 2035 as the end-point), we consider these growth rates to be comparable.

The long-term forecast branches into high, central and low forecasts from the end of the near-term forecast, based on the high, central and low forecasts shown in the long-range growth summary table. The long-range forecast is presented as a range to reflect the increased uncertainty of the forecast as it looks farther into the future. In addition, because the fleet plans beyond five years are less developed, it is reasonable to treat passenger and flight count growth rates interchangeably.

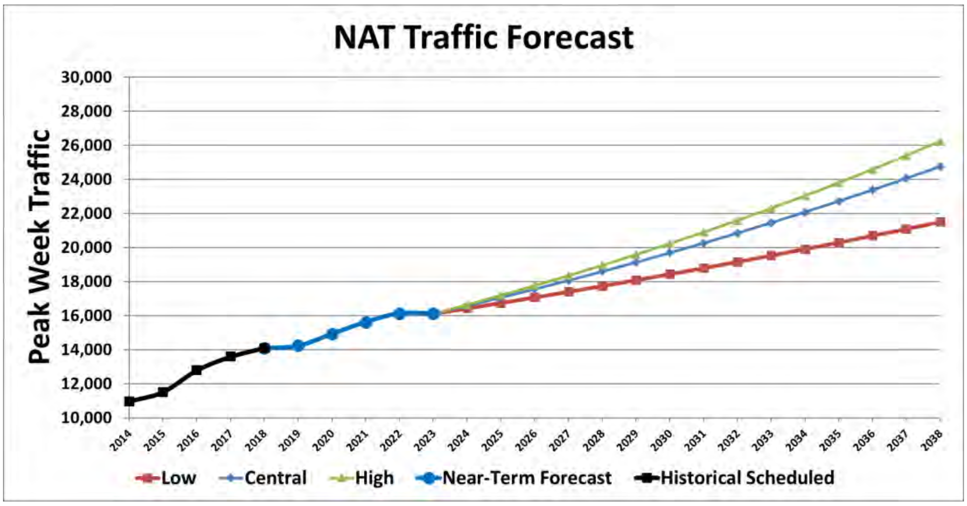


Figure 3: NAT Peak Week Traffic Forecast

When the near-term forecast is combined with the long-term forecast as shown in Figure 3, the average annual growth rate for the entire period ranges from 2.1 percent at the low end, 3.2 percent at the high end and forecast 2.9 percent as the central forecast.

6. CONCLUSIONS

6.1 Near-Term Forecast

Total NAT operations are expected to grow at an average annual rate of 2.7 percent between 2018 and 2023.

Gander and Shanwick, the busiest FIRs, are expected to grow at a rate of 3.1 percent and 2.7 percent annually. These FIRs manage the heavily travelled North Atlantic Organised Track System (NAT-OTS) between North America and Europe. Shanwick has slightly higher activity than Gander due to more intra-FIR traffic with flights between the UK, Iceland, and the rest of Europe.

Traffic through the New York FIR is expected to grow 3.1 percent due to aggressive growth plans from the Middle East carriers, as well as Norwegian Air, Air Europa, and jetBlue. Note that while the percentage growth rate in this region appears to be high, it is being applied to a relatively small base.

Santa Maria will also see a significant growth of 3.5% primarily due to Air Europa which has a large order book for Boeing 788s and 789s. The higher percentage growth rate is being applied to a relatively small base.

Reykjavik is expected to slow significantly to a rate of 1.6% due to the cessation of Wow air traffic, but offset somewhat by Icelandair and Norwegian Air. Bodo is expected to grow by 6.5% which is primarily driven by these same three carriers.

Finally, Nuuk (formerly Sondrestrom) is expected to grow by 3.7% which is primarily driven by Russian carrier Aeroflot, Westjet, and Icelandair, and negatively impacted by Wow air.

LCCs such as Westjet, Norwegian Air, and Air Canada’s Rouge will add significant growth in the North Atlantic.

Large order books by Middle East carriers Etihad, Qatar, Emirates, and Turkish Air will contribute to FIR traffic growth.

NAT traffic volumes by legacy carriers such as American, Delta, Air France, and British Airways are expected to remain relatively stable but will respond to LCC growth by adding more flights of their own.

6.2 Long-Term Forecast

The long-term forecast, which provides a range of expected growth rates for the NAT beyond 2023, is appended to the near-term forecast. The long-term average annual growth rate forecast ranges from 1.94 percent to 3.3 percent, with 2.9 percent as the central forecast. Combining the near-term forecast with the long-term forecast, the average annual growth rate for the entire period ranges from 2.1 percent at the low end, 3.2 percent at the high end. The central forecast projects a 2.9 percent average annual air traffic growth rate in the NAT for 2018 to 2038.

7. CURRENT ISSUES AND RISKS TO FORECAST

Delivery and Retirements Assumptions

While the current forecast may seem aggressive relative to the historical trends, it is a reflection of the aircraft delivery and retirement assumptions. These assumptions may be too optimistic or not aggressive enough, respectively, particularly for year five (2023). This forecast effort will continue reviewing aircraft delivery orders and expected retirements.

Structural Changes

Structural changes can cause significant changes in trends over time. Middle East carriers and LCCs are anticipated to grow aggressively. In addition, fuel price volatility can significantly affect carriers' plans and strategies. Carriers may also go out of business such as Wow air and Air Berlin, which have ended operations, and Alitalia may possibly be next.

Middle East Carriers

Middle East carriers have a very large order book but the identity of new markets is not certain. A conservative estimate of future operations is projected although the Middle East carrier order books indicate potential for greater growth.

Legacy Carriers

Current market level forecast method allows only aircraft that already serve a market to continue to serve it in the future. Legacy carrier aircraft are not assigned new markets because we don't have information on where specific aircraft will be deployed in the future.

Forecast Differences among Carriers

The legacy carrier forecast is a top-down forecast such that we use the total fleet forecast to determine how much traffic will fall into each of the FIRs and O/D routes. For the legacy carriers, growth of current markets is based on their future fleet inventory and their current ratios of utilization. However, an in-depth analysis was performed to identify new markets for the Middle East carriers and the LCCs.

8. FUTURE WORK

Future work on this project includes:

- Update fleet forecast when provided by EFFG
- Update the FIR historical flight tables to include 2018 data
- Prepare 2019 forecast based on latest scheduled information

This forecast will continue to be updated and refined. Forecast updates are planned to be released semi-annually.

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APPENDIX N — PROPOSED AMENDMENT TO THE NAT REGIONAL SUPPLEMENTARY PROCEDURES (NAT SUPPS, DOC 7030/5)

(*paragraph 5.1.4 refers*)

NORTH ATLANTIC (NAT) REGIONAL SUPPLEMENTARY PROCEDURES

These procedures are supplementary to the provisions contained in Annex 2, Annex 6 (Parts I, II and III), Annex 8, Annex 10, Annex 11, PANS-ATM (Doc 4444) and PANS-OPS (Doc 8168). They do not apply in the local areas established by the appropriate authorities around Bermuda, Iceland, the Faroe Islands and Santa Maria, and in Greenland. The area of application of the NAT Regional Supplementary Procedures is included on the Index to Application of Supplementary Procedures chart.

Working Copy

This version of the Working Copy of the 5th Edition of the NAT *Regional Supplementary Procedures* (SUPPS) (Doc 7030), **Amendment No. 9, dated 25 April 2014**, includes the following approved amendment(s) which have not yet been published:

P. f. Amdt. Serial No.	Originator	Brief Description	Date Approved	Date Entered
15/37-NAT 2.1	NAT SPG	Amendment Chapter 2, Flight Plan, Section 9.19	8 January 2016	1 March 2016
15/18-NAT 6.9	NAT SPG	Amendment Chapter 6, Air Traffic Serices, Section 6.9 „MNPS Procedures	19 February 2016	1 March 2016
15/39-NAT 5.2	NAT SPG	Amendment Chapter 5, Surveillance, adoption of word „Nil“ for para 5.3.1.1	26 February 2016	1 March 2016
15/22-NAT 6.1	NAT SPG	Amendment Chapter 6, Air Traffic Services, removal of paragraph 6.117	26 February 2016	3 March 2016
15/40-NAT 2-4	NAT SPG	Amendment Chapter 2, Flight Plans, para 2.1.16 „Aircraft Registration and Aircraft Address“	13 January 2016	16 March 2016
15/38-NAT 4-1, 6-2	NAT SPG	Amendments in Chapter 4 „Navigation“ and Chapter 6 „ATS“	20 April 2016	21 April 2016
16/02-NAT 2-1	NAT SPG	Amendments in Chapter 2-4-6-7-9, clarifying requirements to operate in NAT HLA	20 September 2016	27 September 2016
16/15-NAT 2-2	NAT SPG	Amendments to Chapter 2 „Flight Plans“ concerning free route operations in the NAT	28 September 2017	02 October 2017
17/07-NAT 2-3-4-5-6-7	NAT SPG	Amendments to Chapter 2-3-4-5-6-7 developed by the NAT PBCS project Team	1 February 2018	27 February 2018
17-01-NAT 3-4	NAT SPG	Amendment Chapter 3 – Communications, paragraph 3.5.1 Selective calling (SELCAL), removal of the *Note*	15 May 2018	6 June 2018

Chapter 6. AIR TRAFFIC SERVICES

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6.2 SEPARATION

6.2.1 Lateral
(P-ATM – Chapter 5)

6.2.1.1 Minimum lateral separation shall be:

a) 42.6 km (23 NM) between aircraft operating within the control area of the Gander Oceanic FIR, Reykjavik Oceanic FIR, Santa Maria Oceanic FIR and Shanwick Oceanic FIR. This minima is applied in accordance with 5.4.1.2.1.6 b) of the PANS-ATM and provided that the following conditions are met:

1) communication – CPDLC RCP 240 in accordance with 3.1.1.1;

2) navigation – RNP 4 in accordance with 4.1.2.1; and

3) surveillance – ADS-C RSP 180 in accordance with 5.1.1.1.

b) 55.5 km (30 NM) between aircraft operating within the control area of the New York Oceanic East FIR and ~~Santa Maria Oceanic FIR~~ provided that the following conditions are met:

1) communication – CPDLC RCP 240 in accordance with 3.1.1.1;

2) navigation – RNP4 in accordance with the provisions of 4.1.2.1; and

3) surveillance –ADS-C RSP 180 in accordance with 5.1.1.1.

Note – Guidance concerning RCP and RSP specifications, application and performance requirements can be found in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869~~).~~

c) 93 km (50 NM) between aircraft operating in the New York Oceanic East FIR and Santa Maria Oceanic FIR meeting RNP 10 or RNP 4 specification in accordance with the provisions of 4.1.1.1 or 4.1.2.1, respectively.

d) 110 km (60 NM) between aircraft which meet the minimum navigation performance specifications (MNPS) provided that a portion of the route of the aircraft is within, above, or below NAT HLA;

~~e) 167 km (90 NM) between aircraft operating outside the NAT HLA and at least one aircraft does not meet the MNPS:~~

~~1) between the Iberian Peninsula and the Azores Islands; and~~
~~2) between Iceland and points in Scandinavia and in the United Kingdom;~~

e~~f~~) 167 km (90 NM) between aircraft not approved RNP 10 or RNP 4 operating outside NAT HLA where no portion of the route of the aircraft is within, above, or below NAT HLA:

1) between the United States/Canada and Bermuda; and
2) west of 55°W between the United States, Canada or Bermuda and points in the CAR Region;

f~~g~~) 223 km (120 NM) between other aircraft;

except that lower minima in 5.4.1.2 of the PANS-ATM may be applied, or further reduced in accordance with 5.11 when the conditions specified in the relevant PANS-ATM provisions are met (see 5.4).

6.2.1.2 In the practical application of the minima in 6.2.1.1 c), d)~~,~~ and e) ~~and f)~~, tracks may be spaced with reference to their difference in latitude, using one degree instead of 110 km (60 NM); one and one-half degrees instead of 167 km (90 NM); and two degrees instead of 223 km (120 NM), provided that in any interval of ten degrees of longitude, the change in latitude of at least one of the tracks does not exceed:

a) three degrees at or south of 58°N;
b) two degrees north of 58°N and south of 70°N; and
c) one degree at or north of 70°N and south of 80°N.

At or north of 80°N, or where the above rates of change of latitude are exceeded, the required lateral separation must be ensured by reference to the track spacing expressed in nautical miles.

6.2.2 Longitudinal

(P-ATM – Chapter 5)

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6.2.2.3 Performance-based longitudinal separation minima shall be:

a) 93 km (50 NM) between aircraft operating within the control area of the New York Oceanic East FIR and ~~Santa Maria Oceanic FIR~~ in accordance with the provisions in 5.4.2.9 of the PANS-ATM provided that the following conditions are met:

   1) communication – CPDLC RCP 240 in accordance with 3.1.1.1;
   2) navigation – RNP 10 or RNP 4 specification in accordance with the provisions of 4.1.1.1 or 4.1.2.1, respectively; and
   3) surveillance – ADS-C shall be monitored against ADS-C RSP 180 in accordance with 5.1.1.1.

b) 55.5 km (30 NM) between aircraft operating within the control area of the New York Oceanic East FIR and Santa Maria Oceanic FIR in accordance with the provisions in 5.4.2.9 of the PANS-ATM and provided that the following conditions are met:

   1) communication – CPDLC RCP 240 in accordance with 3.1.1.1;
   2) navigation – RNP 4 specification in accordance with the provisions of in accordance with 4.1.2.1; and
   3) surveillance – ADS-C shall be monitored against ADS-C RSP 180 in accordance with 5.1.1.1.

c) 5 minutes between aircraft operating in the Gander Oceanic FIR, Reykjavik Oceanic FIR, Shanwick Oceanic FIR and Santa Maria Oceanic FIR provided that the following conditions are met;

   1) communication – CPDLC RCP 240 in accordance with 3.1.1.1;
   2) navigation – RNP 10 or RNP4 in accordance with 4.1.1.1 or 4.1.2.1; and
   3) surveillance – ADS-C RSP 180 in accordance with 5.1.1.1.

. . .

6.2.7 Airspace reservations

6.2.7.1 Separation minima between moving temporary airspace reservations

6.2.7.1.1 Lateral separation shall be:

a) 110 km (60 NM) between the closest tracks of any aircraft for which the airspace is reserved, provided all aircraft or formation flights meet the MNPS; or

b) 223 km (120 NM) between the closest tracks of any aircraft for which the airspace is reserved~~, except that in the New York oceanic control area (OCA) west of 60°W, 167 km (90 NM) may be applied~~.

Note.— A formation flight with at least one of the aircraft in the formation meeting MNPS is deemed to meet the requirement for the application of 110 km (60 NM) in a).

. . .

6.2.7.2 Separation minima between stationary temporary airspace reservations

6.2.7.2.1 Lateral separation shall be:

a) 110 km (60 NM) between the boundaries of stationary temporary airspace reservations, provided the requesting agencies have guaranteed to confine their activities to the requested airspace~~, except that in the New York OCA west of 60°W, 84 km (45 NM) may be applied~~; or

b) 223 km (120 NM) between the boundaries of the airspace reservations, if no guarantees have been given~~, except that in the New York OCA west of 60°W, 167 km (90 NM) may be applied~~.

6.2.7.3 Separation minima between moving temporary airspace reservations and other aircraft

6.2.7.3.1 Lateral separation shall be:

a) 110 km (60 NM) between the track of an aircraft operating under the control of the ATC unit concerned and the closest track of any of the aircraft for which the airspace is reserved, provided all aircraft meet the MNPS requirements and a portion of the route of the aircraft is within, above or below NAT HLA; or

b) 110 km (60 NM) between the track of an aircraft operating under the control of the ATC unit concerned and the track of a formation flight for which the airspace has been reserved, provided at least one aircraft in the formation and the aircraft operating under the control of the ATC unit meet the MNPS requirements and a portion of the route of the aircraft is within, above or below NAT HLA; or

c) 223 km (120 NM) between the track of an aircraft operating under the control of the ATC unit concerned and the closest track of any of the aircraft for which the airspace is reserved~~, except that in the New York OCA west of 60°W, 167 km (90 NM) may be applied~~.

Chapter 7. SAFETY MONITORING

. . .

7.2 AIRSPACE MONITORING

7.2.1 General

7.2.1.1 Adequate monitoring of flight operations shall be conducted to provide data to assist in the assessment of the achieved lateral navigation performance of the aircraft population ~~in relation to the lateral separation minimum~~. A safety assessment shall be carried out periodically, based on the data collected, to verify that the safety level continues to be met. Data shall include operational errors due to all causes.

Note.— Guidance material on monitoring and conducting safety assessments is contained in the Manual on Airspace Planning Methodology for the Determination of Separation Minima *(Doc 9689) and the* Safety Management Manual (SMM) *(Doc 9859).*

7.2.2 RNAV

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~~**7.2.2.2 Legacy MNPS**~~

~~7.2.2.2.1 Adequate monitoring of flight operations in the NAT Region shall be conducted to assist in the assessment of continuing compliance of aircraft with the lateral navigation capabilities specified below:~~

~~a) the standard deviation of lateral track errors shall be less than 11.7 km (6.3 NM);~~
~~b) the proportion of the total flight time spent by aircraft 56 km (30 NM) or more off the cleared track shall be less than 5.3 × 10^{-4}; and~~
~~c) the proportion of the total flight time spent by aircraft between 93 and 130 km (50 and 70 NM) off the cleared track shall be less than 1.3 × 10^{-4}.~~

~~*Note.— Guidance material on monitoring of flight operations in the NAT Region is contained in the* North Atlantic Operations and Airspace Manual *(NAT Doc 007).*~~

Chapter 9. SPECIAL PROCEDURES

9.1 EMERGENCY DESCENT PROCEDURES
(P-ATM – Chapter 15)

9.1.1 Action by the pilot-in-command

9.1.1.1 ~~Descent through the RVSM airspace and/or NAT HLA~~

~~9.1.1.1.1 An aircraft that is not RVSM-approved and is unable to maintain a flight level above RVSM airspace should descend to a flight level below RVSM airspace.~~

~~9.1.1.1.2 An aircraft that does not meet the MNPS and is unable to maintain a flight level above the NAT HLA should descend to a flight level that is below the airspace.~~

~~9.1.1.1.3 An aircraft compelled to make a descent through the NAT HLA, whether continuing to destination or turning back, should, if its descent will conflict with an organized track:~~

~~a) plan to descend to a level below FL 280;~~

~~b) prior to passing FL 410, proceed to a point midway between a convenient pair of organized tracks prior to entering that track system from above;~~

~~c) while descending between FL 410 and FL 280, maintain a track that is midway between and parallel with the organized tracks; and~~

~~d) contact ATC as soon as practicable and request a revised ATC clearance.~~**Nil.**

9.3 AIR-GROUND COMMUNICATION FAILURE
(A2 – Chapter 3; P-ATM – Chapter 15; P-OPS, Vol. I)

. . .
Communications failure prior to entering NAT Region
. . .

9.3.3 If operating without a received and acknowledged oceanic clearance, the pilot shall enter oceanic airspace at the first oceanic entry point, level and speed, as contained in the filed flight plan, and proceed via the filed flight plan route to ~~landfall~~ the oceanic exit point. That first oceanic level and speed shall be maintained ~~to landfall~~until the oceanic exit point.

9.6 EN-ROUTE DIVERSION

~~9.6.1 En-route diversion across the prevailing NAT air traffic flow~~

~~9.6.1.1 Before diverting across the flow of adjacent traffic, the aircraft should climb above FL 410 or descend below FL 280 using the procedures specified in 15.2.2 of the PANS-ATM. However, if the pilot is unable or unwilling to do so, the aircraft should be flown at a level as defined in 15.2.2.3 b) of the PANS-ATM for the diversion until a revised ATC clearance is obtained.~~Nil.

APPENDIX O — NAT GANP/ASBU 2018 IMPLEMENTATION STATUS REPORT

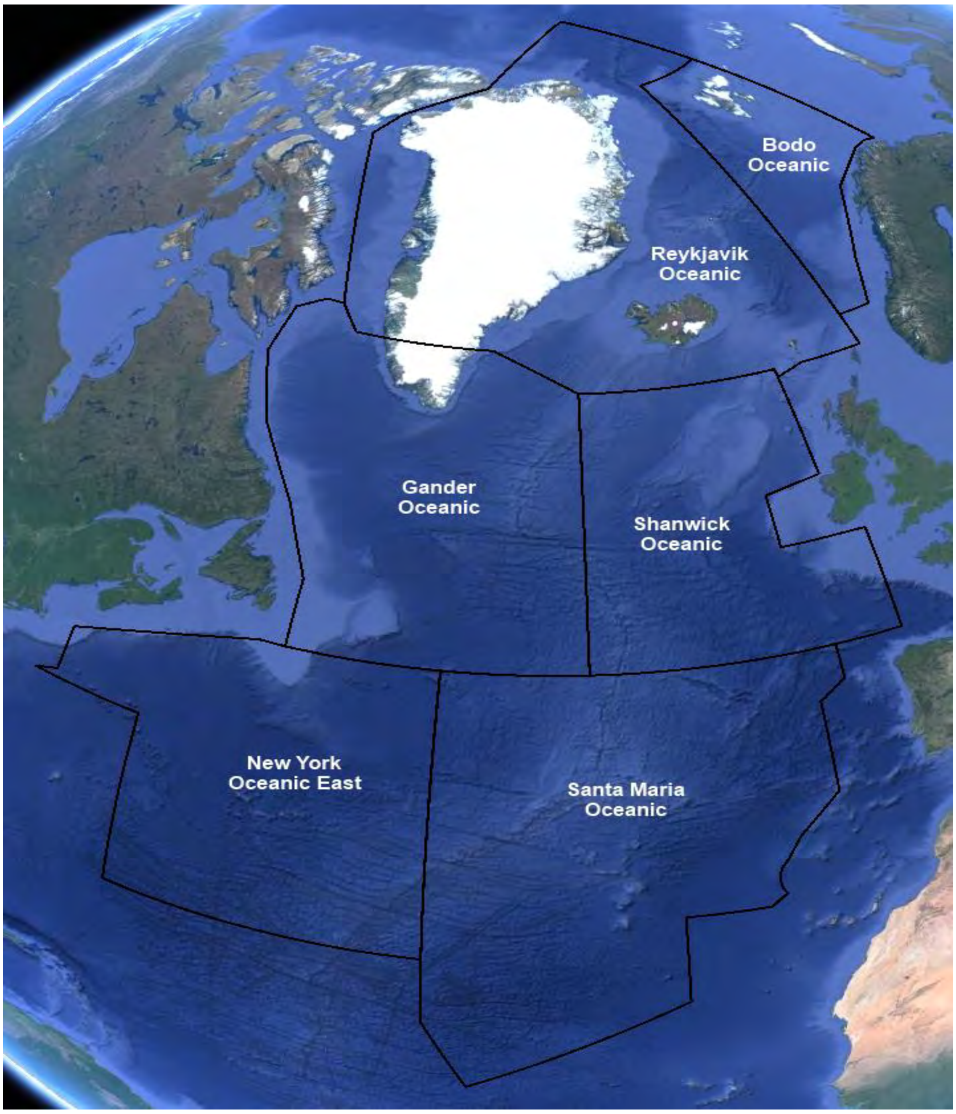
(*paragraph 5.2.1 refers*)

STARTS ON NEXT PAGE

APPENDIX O — 2018 GANP/ASBU IMPLEMENTATION STATUS REPORT – NAT REGION

(*paragraph 5.2.1 refers*)

GLOBAL AIR NAVIGATION PLAN (GANP)/AVIATION SYSTEM BLOCK UPGRADES (ASBU) IMPLEMENTATION STATUS REPORT - NORTH ATLANTIC (NAT) REGION



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1. INTRODUCTION

1.1 NAT eANP Volume III contains dynamic/flexible plan elements related to the implementation of the air navigation system and its modernization in line with the ICAO Aviation System Block Upgrades (ASBUs) and associated technology roadmaps described in the Global Air Navigation Plan (GANP) and.is used as a tool for monitoring and reporting the status of implementation of the above-mentioned elements, through the use of specific tables by appropriate NAT working groups as endorsed by North Atlantic Systems Planning Group (NAT SPG). The status of implementation is updated on a regular basis as endorsed by the NAT SPG.

1.2 The management of Volume III is the responsibility of the NAT SPG.

2. AVIATION SYSTEM BLOCK UPGRADES (ASBUs), MODULES AND ROADMAPS

2.1. The ASBU Modules and Roadmaps form a key component to the GANP, noting that they will continue to evolve as more work is done on refining and updating their content and in subsequent development of related provisions, support material and training.

2.2. Although the GANP has a worldwide perspective, it is not intended that all Block Upgrade Modules are required to be applied in every State, sub-region and/or region. Many of the Block Upgrade Modules contained in the GANP are specialized packages that should be applied only where the specific operational requirement exists or corresponding benefits can be realistically projected. Accordingly, the Block Upgrade methodology establishes an important flexibility in the implementation of its various Modules depending on a region, sub-region and/or State's specific operational requirements.

2.3. The latest 5th Edition of the GANP was endorsed by the 39th Assembly of ICAO in October 2016.

3. PLANNING METHODOLOGY

3.1 Guided by the GANP, the regional planning process starts by identifying the homogeneous ATM areas, major traffic flows and international aerodromes. An analysis of this data leads to the identification of opportunities for performance improvement. Available technologies and ASBU Modules are evaluated to identify which of them best provide the needed operational improvements. Depending on the complexity of the selected technology or module element, additional planning steps may need to be undertaken including financing and training needs. Finally, regional plans would be developed for the deployment of modules by drawing on supporting requirements. This is an iterative planning process which may require repeating several steps until a final plan with specific regional targets is in place. This planning methodology requires full involvement of States, service providers, airspace users and other stakeholders, thus ensuring commitment by all for implementation.

4. REVIEW AND EVALUATION OF AIR NAVIGATION PLANNING

4.1 The progress and effectiveness against the priorities set out in the NAT air navigation plan is periodically reported, using an agreed reporting format, to ICAO.

4.2 NAT IMG agreed (NAT IMG Decision 48/15) that the monitoring and reporting will be carried out by NAT IMG contributory groups by using the following tools:

a) NAT ASBU implementation status forms;

b) NAT Air Navigation Reporting Form-ASBU (NAT ANRF-ASBU) and NAT ANRF - Regional Aviation System Improvements (RASI) forms.

4.3 For those modules that are related to and applicable in the aerodrome areas, e.g AMAN/WAKE/A-SMGCS, the status information is provided only for those aerodromes that are listed in the NAT AOP Table.

4.4 For those modules that are applicable to the en-route phase of flight for operations in the NAT, the status is provided at the State level.

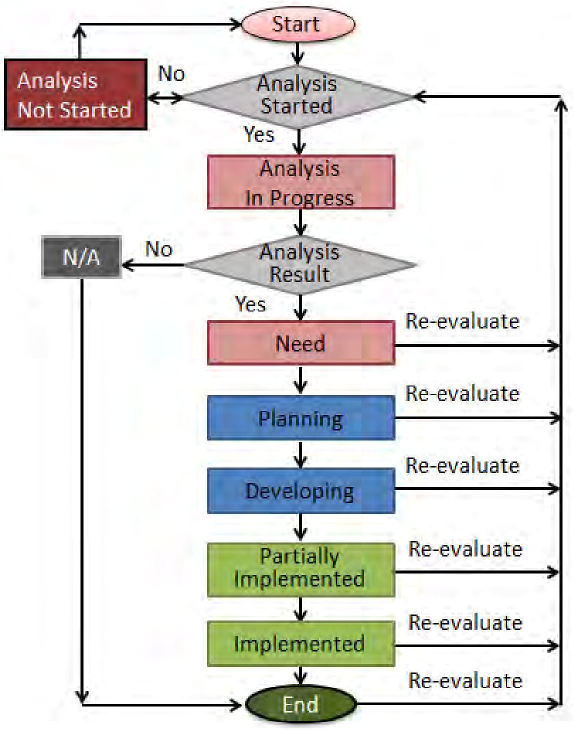
4.5 Depiction of the general planning and timelines is provided through the NAT Service Development Roadmap, which is also maintained by appropriate NAT working groups.

4.6 Figure 1 depicts the workflow for analysing and implementing ASBU Module elements.

4.7 The significance of each step in the workflow is as follows:

- **Analysis Not Started** – The requirement to implement this ASBU Module element has not yet been assessed
- **Analysis In Progress** – A Need Analysis as to whether or not this ASBU Module element is required is in progress
- **N/A** – The ASBU Module element is not required
- **Need** - The Need Analysis concluded that the ASBU Module element is required, but planning for the implementation has not yet begun
- **Planning** – Implementation of this ASBU Module element is planned, but not started
- **Developing** – Implementation of this ASBU Module element is in the development phase, but not yet operational
- **Partially Implemented** – Implementation of this ASBU Module element is partially completed and/or operational but all planned implementations are not yet complete
- **Implemented** - Implementation of this ASBU Module element has been completed and/or is fully operational where the need was identified

FIGURE 1 – ANALYSIS AND IMPLEMENTATION WORKFLOW



5. REPORTING AND MONITORING RESULTS

5.1 Reporting and monitoring results are analyzed by the NAT SPG, States and ICAO to steer the air navigation improvements, take corrective actions and review the allocated objectives, priorities and targets if needed. The results will also be used by ICAO and aviation partner stakeholders to develop the annual Global Air Navigation Report. The report results will provide an opportunity for the international civil aviation community to compare progress across different ICAO regions in the establishment of air navigation infrastructure and performance-based procedures.

5.2 The reports will also provide the ICAO Council with detailed annual results on the basis of which tactical adjustments will be made to the performance framework work programme, as well as triennial policy adjustments to the GANP.

6. NAT ASBU planning and implementation forms

6.1 Block 0

NAT Region Implementation Status of Block Elements – Block 0 Modules

Data provided by Canada (CAN), Denmark (DK), Iceland (ISL), Ireland (IRL), Norway (NO), Portugal (PO), United States (US) and United Kingdom (UK)

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
Performance Improvement Area 1: Airport Operations									
ACDM	1. implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport.	PO		ISL	DK,NO,UK ~~CAN~~		CAN	~~IRL, US~~	IRL,US
APTA	1. PBN Approach Procedures	PO	DK		~~CAN,~~UK			ISL,CAN	IRL, NO,US
	2. GBAS Landing System (GLS) Approach procedures	ISL, PO	DK, CAN ,IRL		NO~~,CAN~~,UK				US
RSEQ	1. AMAN and time-based metering	PO			DK,NO~~,CAN~~,UK		CAN	ISL	US,IRL
	2. Departure management	ISL, PO			NO,~~CAN,~~UK,IRL	CAN		US	
	3. Point merge	PO			ISL,DK,NO,US,CAN,UK				IRL
SURF	1. Surveillance	PO			DK,NO,~~CAN~~,UK		ISL	~~IRL~~CAN	US,IRL
	2. Alerting	PO			DK,NO,~~CAN~~,UK		ISL	CAN	US,IRL
	3. Enhanced vision systems for taxi operations	ISL,PO	CAN		US,UK				
WAKE	1. Increasing aerodrome arrival operational capacity	ISL,CAN			DK,NO,~~CAN~~,UK, PO			IRL,US	~~US~~
	2. Increasing aerodrome departure operational capacity	ISL,CAN			DK,NO,~~CAN~~,UK, PO			IRL,US	~~US~~
Performance Improvement Area 2: Globally Interoperable Systems and Data									
AMET	1. WAFS				DK,IRL,NO,~~CAN,UK~~,UK				ISL,US,PO,CAN
	2. IAVW				DK,IRL,NO,~~CAN,UK~~,UK				ISL,US,PO,CAN

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
	3. TCAC forecasts				ISL,DK,IRL,NO,~~CAN,UK~~,UK				US,PO,CAN
	4. Aerodrome warnings	ISL,PO			DK,NO,~~CAN,UK~~,UK			CAN	IRL,US
	5. Wind shear warnings and alerts	ISL,PO			~~CAN~~,UK			CAN	DK,IRL,US,NO
	6. SIGMET				~~CAN~~				ISL,DK,IRL,US,NO, UK,PO,CAN
	7. Other OPMET information (METAR, SPECI and/or TAF)		DK		~~CAN~~				ISL,IRL,US,NO,UK, PO,CAN
	8. QMS for MET				~~CAN~~				ISL,DK,IRL,US,NO, UK,PO,CAN
DATM	1. Aeronautical Information Exchange Model (AIXM)	UK			DK,NO,~~UK~~	CAN ,PO		ISL	US,IRL
	2. eAIP						CAN		ISL,US,IRL,DK,NO, ~~UK,~~PO,UK
	3. initial introduction of digital processing and management of information, through aeronautical information service (AIS)/aeronautical information management (AIM) implementation	~~ISL~~	CAN				ISL	PO,IRL, UK	US
	4. QMS for AIM				DK,~~UK~~				ISL,US,IRL,NO,CA N,PO,UK
FICE	1. improve coordination between air traffic service units (ATSUs) by using ATS interfacility data communication (AIDC) defined by the ICAO Manual of Air Traffic Services Data Link Applications (Doc 9694).			CAN	DK,NO			ISL,UK	US,~~CAN,UK~~,PO, IRL (OLDI)
Performance Improvement Area 3: Optimum Capacity and Flexible Flights									
ACAS	1. ACAS II (TCAS version 7.1)	CAN			US,DK,~~CAN,UK~~				ISL,IRL, NO,PO,UK
ASEP	1. ATSA-AIRB	ISL,PO			IRL,DK,NO,CAN,UK				US
	2. ATSA-VSA	ISL,CAN,PO			IRL,DK,NO,UK				US
ASUR	1. ADS-B				DK,~~UK~~	IRL	NO		ISL,US,CAN,PO,UK

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
	2.Multilateration (MLAT)				DK,NO~~,CAN~~,UK		ISL	IRL,CAN	US,PO
FRTO	1. Airspace planning	~~PO~~			DK~~,UK~~			PO	ISL,US,NO,CAN, IRL,UK
	2. Flexible Use of Airspace (FUA)				DK~~,UK~~			PO	ISL,IRL,US,NO,CAN,UK
	3. Flexible routing				DK~~,UK~~				ISL,IRL,US,NO,CAN,PO,UK
NOPS	1. ATFM				DK~~,UK~~	ISL		PO	US,IRL,NO,CAN,UK
OPFL	1. ITP using ADS-B	PO			ISL,DK,NO,CAN,UK, IRL				US
SNET	1. Short Term Conflict Alert implementation (STCA)				DK~~,UK~~			ISL,NO	US,IRL,CAN,PO,UK
	2. Area Proximity Warning (APW)	ISL			DK~~,UK~~			PO	US,IRL,NO,CAN,UK
	3. Minimum Safe Altitude Warning (MSAW)	ISL			DK,NO~~,CAN~~,UK			PO	US,IRL,CAN
Performance Improvement Area 4: Efficient Flight Paths									
CCO	1. Implement continuous climb operations in conjunction with performance-based navigation (PBN)				DK~~,CAN,UK~~			ISL,IRL ,PO	US, NOR,CAN,UK
CDO	1. Use performance-based airspace and arrival procedures allowing an aircraft to fly its optimum profile using continuous descent operations (CDOs).				DK~~,CAN,UK~~			ISL,PO	US,IRL, NO,CAN,UK
TBO	1. Implement a set of data link applications supporting surveillance and communications in air traffic services				DK~~,UK~~				ISL,IRL,US,NO,CAN,PO,UK

6.2 Block 1

NAT Region Implementation Status of Block Elements – Block 1 Modules

Data provided by Canada (CAN), Denmark (DK), Iceland (ISL), Ireland (IRL), Norway (NO), Portugal (PO), United States (US) and United Kingdom (UK)

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
Performance Improvement Area 1: Airport Operations									
ACDM	1. enhance the planning and management of airport operations and allow their full integration in the air traffic management using performance targets compliant with those of the surrounding airspace	ISL,US, NO,PO			CAN,UK			~~IRL~~	DK,IRL
APTA	1. Progress further with the universal implementation of performance-based navigation (PBN) and ground-based augmentation system (GBAS) landing system (GLS) approaches. PBN and GLS (CAT II/III) procedures	ISL,US, NO,PO	DK,IRL		CAN,UK				
RATS	1. Provision of tower control (TWR) or aerodrome flight information service (AFIS) for single aerodrome(s) by remotely located air traffic controllers (ATCO) or aerodrome flight information service officers (AFISO)	US,PO	~~ISL~~		DK,NO,CAN,UK		ISL	IRL	
	2. Provision of TWR or AFIS for multiple aerodromes by a single ATCO or AFISO	US,PO	ISL		NO,CAN,UK			IRL	DK
	3. Remote provision of ATS for contingency situations	US, NO	ISL		DK,CAN,UK	PO		IRL	

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
RSEQ	1. Surface management of runway demand and sequencing aircraft on the ground to support departure operations based on precise surface movement tracking	ISL,US, PO			NO,CAN,UK	IRL			DK
	2. Integration of departure sequencing and surface management	ISL,US, PO			DK,NO,CAN,UK				
	3. Arrival metering extended across FIR boundaries	ISL,US, CAN,PO			DK,NO,UK			~~IRL~~	IRL
	4. Assignment of RNAV/RNP routes linked to controlled time of arrival at metering fixes	ISL,US, CAN,PO			NO,UK				DK
SURF	1. Basic surface situation awareness (SURF) through display of other aerodrome traffic to aircraft via ADS-B or TIS-B	US,PO	ISL		DK,NO,CAN,UK,IRL				
WAKE	1. PANS-ATM aircraft leader/follower pair-wise wake turbulence separation minima	ISL,US, NO,PO			DK,CAN,UK,IRL				
	2. Wake Turbulence Mitigation for Arrivals (WTMA) on parallel runways with runway centre lines spaced less than 760 m (2 500 feet) apart or on a single runway through variable application of wake turbulence separation dependant on the crosswinds present along the approach corridor	US			ISL,DK,NO,CAN,UK,PO, IRL				

Module	Elements	Need Analysis: Not Started	Need Analysis: In Progress	Need Analysis: Need	Need Analysis: N/A	Implementation Status (if Element is needed): Planning	Implementation Status (if Element is needed): Developing	Implementation Status (if Element is needed): Partially Implemented	Implementation Status (if Element is needed): Implemented
	3. Wake Turbulence Mitigation for Departures (WTMD) on parallel runways with runway centre lines spaced less than 760 m (2 500 feet) through reduction of separation between departures when runway crosswinds are of sufficient strength and persistence	US			ISL,DK,NO,CAN,UK,PO,IRL				
Performance Improvement Area 2: Globally Interoperable Systems and Data									
AMET	1. Producing meteorological information elements that can be ingested by automated decision support tools	ISL,US~~,~~ ~~UK~~	DK		NO,CAN,UK			PO	IRL
	2. Automated processing of meteorological information to derive predicted effects on airspace capacity	ISL,US,IRL~~,UK~~,PO			DK,NO,CAN,UK				
	3. Automated processing of meteorological information to derive predicted effects on aerodrome capacity	ISL,US,IRL~~,UK~~,PO			DK,NO,CAN,UK				
	4. Comparison of predicted meteorological airspace capacity constraints to projected demand	ISL,US,IRL~~,UK~~,PO			DK,NO,CAN,UK				
	5. Comparison of predicted meteorological aerodrome capacity constraints to projected demand	ISL,US,IRL~~,UK~~,PO			DK,NO,CAN,UK				
	6. Meteorological information integrated decision support that creates ranked mitigation strategies	ISL,US,IRL~~,UK~~,PO	DK		NO,CAN,UK				

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
DATM	1. Implementation of digital information management using WXXM for meteorological information	ISL,US~~,UK~~,PO			DK, NO,UK	IRL, CAN			
	2. Implementation of digital information management using FIXM for flight and flow information	ISL,US,IRL~~,UK~~,PO			DK, NO,UK	CAN			
	3. Implementation of digital information management for aircraft performance-related data	ISL,US,IRL~~,UK~~,PO			DK, NO,UK	CAN			
FICE	1. introduce FF-ICE, Step 1 providing ground-ground exchanges before departure using common flight information exchange model (FIXM) and extensible markup language (XML) standard formats. FIXM	ISL,US,IRL,PO			DK, NO,UK	CAN			
SWIM	1. Implementation of system-wide information management (SWIM) services (applications and infrastructure) creating the aviation intranet based on standard data models, and internet-based protocols to maximize interoperability.	ISL,US, NO~~,PO~~	UK		DK~~,UK~~		CAN,PO	IRL	
Performance Improvement Area 3: Optimum Capacity and Flexible Flights									
ASEP	1. Increased capacity and efficiency through interval management	ISL,US, PO			DK,IRL,NO,CAN,UK				
FRTO	1. Free routing,.	US			DK~~,UK~~		~~PO~~	NO	IRL,ISL, CAN,PO,UK
	2. Reduced route spacing	US			IRL			PO	ISL,UK
	3. Dynamic sectorization	ISL,US			DK	NO			IRL,CAN,UK,PO

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
NOPS	1 Integrating ATFM and Airspace Organization and Management (AOM) in the design of alternative route options for ATFM	ISL,US			DK,NO~~,UK~~			PO	IRL,CAN,UK
	2. Using trajectory projections as soon as possible after departure to update ATFM requirements and perform additional ATFM smoothing for single and converging flows	ISL,US			DK,NO~~R~~,UK			PO	IRL,CAN
	3. Initial User Driven Prioritization Process (UDPP) whereby operators affected by ATFM measures can collaborate with each other and ATFM to devise alternative measures that serve ATFM requirements while at the same time taking account of operators' priorities	ISL,US			DK,NO~~R~~,UK			PO	CAN, IRL
	4 Full FUA	ISL,US						PO,UK	IRL
	5. Complexity management	ISL,PO, US,UK							
SNET	1. Enhance safety by reducing the risk of controlled flight into terrain accidents on final approach and the risk of unstable approach through the use of approach path monitor (APM).	ISL,US, PO			DK,NO,CAN,UK,IRL				

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
Performance Improvement Area 4: Efficient Flight Paths									
CDO	1. CDO procedures defined as vertical paths to be followed within specified tolerances	US,PO			DK,NO,CAN,UK, IRL			ISL	
RPAS	1. Streamlined process for RPA access to non-segregated airspace	US,PO			DK,NO,CAN,UK	ISL			IRL
	2. Defined airworthiness certification for RPA	US,PO			DK,NO,CAN,UK	ISL			IRL
	3. Defined operator certification for RPA operators	US,PO			DK,NO,CAN,UK	ISL			IRL
	4. Defined communication performance requirements for Command and Control (C2) links and for ATC communications	US,PO			DK,IRL,NO,CAN,UK, IRL	ISL			
	5. Defined remote pilot licencing requirements	US,PO			DK,NO,CAN,UK	~~ISL~~			IRL,ISL
	6. Defined detect and avoid technology performance requirements	US,PO			DK,NO,CAN,UK, IRL	ISL			
TBO	1. Initial 4D operations by specifying Required Time of Arrival (RTA)	ISL,US, PO			DK,NO,UK, IRL				CAN
	2. Data Link Operational Terminal Information Service (D-OTIS)	ISL,US, PO			DK,NO,CAN,UK			IRL	

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
	3. Departure clearances via data link (DCL)	US,PO	ISL		DK,NO,CAN,UK				IRL
	4. Data Link Taxi (D-TAXI)	ISL,US, PO			DK,IRL,NO,CAN,UK				

7. NAT ASBU planning and implementation analysis

7.1 Provisional implementation indicators

Module Code	Module Title	Implementation Indicator	Remarks
1	2	3	4
B0-APTA	Optimization of Approach Procedures including vertical guidance	% of international aerodromes having at least one runway end provided with APV Baro-VNAV or LPV procedures	
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	% of applicable international aerodromes having implemented increased runway throughput through optimized wake turbulence separation	
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	% of applicable international aerodromes having implemented AMAN / DMAN	
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	% of applicable international aerodromes having implemented A-SMGCS Level 2	
B0-ACDM	Improved Airport Operations through Airport-CDM	% of applicable international aerodromes having implemented improved airport operations through airport-CDM	
B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs	
B0-DATM	Service Improvement through Digital Aeronautical Information Management	- % of States having implemented an AIXM based AIS database - % of States having implemented QMS	
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	- % of States having implemented SADIS / WIFS - % of States having implemented QMS	
B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	% of FIRs in which FUA is implemented	
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	% of FIRs within which all ACCs utilize ATFM systems	
B0-ASUR	Initial capability for ground surveillance	% of FIRs where ADS-B OUT and/or MLAT are implemented for the provision of surveillance services in identified areas.	
B0-ASEP	Air Traffic Situational Awareness (ATSA)	% of States having implemented air traffic situational awareness	
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	% of FIRs having implemented in-trail procedures	
B0-ACAS	ACAS Improvements	% of States requiring carriage of ACAS (with TCAS 7.1 evolution)	
B0-	Increased Effectiveness of	% of States having implemented ground-	

Module Code	Module Title	Implementation Indicator	Remarks
1	2	3	4
SNET	Ground-Based Safety Nets	based safety-nets (STCA, APW, MSAW, etc.)	
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	- % of international aerodromes / TMAs with PBN STAR implemented - % of international aerodromes/TMA where CDO is implemented	
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	% of FIRs utilising data link en-route in applicable airspace	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	- % of international aerodromes / TMAs with PBN SID implemented - % of international aerodromes/TMA where CCO is implemented	

7.2 Implementation progress assessment for B0 modules

Module	Elements	Number of fully or partially implemented	Number of N/A	% of implemented with N/A excluded
ACDM	1. Implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport	2	43	~~50~~40%
APTA	1. PBN Approach Procedures)	~~4~~5	~~2~~1	~~66.7~~71%
	2. GBAS Landing System (GLS) Approach procedures	~~2~~1	~~3~~2	~~40~~17%
RSEQ	1. AMAN and time-based metering via controlled time of arrival to a reference fix	~~2~~3	43	~~50~~60%
	2. Departure management	1	3	20%
	3. Point merge	1	6	50%
SURF	1. Surveillance	~~2~~3	43	~~50~~60%
	2. Alerting	~~1~~3	43	~~25~~60%
	3. Enhanced vision systems for taxi operations	0	2	0%
WAKE	1. Increasing aerodrome arrival operational capacity	~~1~~2	~~5~~4	~~33.3~~50%
	2. Increasing aerodrome departure operational capacity	~~1~~2	~~5~~4	~~33.3~~50%
AMET	1. WAFS	~~3~~4	~~5~~4	100%
	2. IAVW	~~3~~4	~~5~~4	100%
	3. TCAC forecasts	~~2~~3	~~6~~5	100%
	4. Aerodrome warnings	~~2~~3	43	~~50~~60%
	5. Wind shear warnings and alerts	~~4~~5	~~2~~1	~~66.7~~71%
	6. SIGMET	~~7~~8	~~1~~0	100%
	7. Other OPMET information (METAR, SPECI and/or TAF)	~~6~~7	~~1~~0	~~85.7~~88%
	8. QMS for MET	~~7~~8	~~1~~0	100%
DATM	1. Aeronautical Information Exchange Model (AIXM)	3	~~3~~2	~~60~~50%
	2. eAIP	7	0	~~87.5~~88%
	3. initial introduction of digital processing and management of information, through aeronautical information service (AIS)/aeronautical information management (AIM) implementation	~~0~~4	0	~~0~~50%
	4. QMS for AIM	~~6~~7	~~2~~1	100%
FICE	1. improve coordination between air traffic service units (ATSUs) by using ATS interfacility data communication (AIDC) defined by the ICAO Manual of Air Traffic Services Data Link Applications (Doc 9694).	~~6~~5	2	~~100~~83%
ACAS	1. ACAS II (TCAS version 7.1)	~~4~~5	42	~~100~~83%
ASEP	1. ATSA-AIRB	1	5	33~~.3~~%
	2. ATSA-VSA	1	4	25%
ASUR	1. ADS-B	~~4~~5	~~2~~1	~~66.7~~71%
	2.Multilateration (MLAT)	~~3~~4	3	~~60~~80%
FRTO	1. Airspace planning	~~5~~7	~~2~~1	~~83.3~~100%

Module	Elements	Number of fully or partially implemented	Number of N/A	% of implemented with N/A excluded
	2. Flexible Use of Airspace (FUA)	~~6~~7	~~2~~1	100%
	3. Flexible routing	~~6~~7	~~2~~1	100%
NOPS	1. ATFM	~~5~~6	~~2~~1	~~83.3~~86%
OPFL	1. ITP using ADS-B	1	6	50%
SNET	1. Short Term Conflict Alert implementation (STCA)	~~6~~7	~~2~~1	100%
	2. Area Proximity Warning (APW)	~~5~~6	~~2~~1	~~83.3~~86%
	3. Minimum Safe Altitude Warning (MSAW)	~~3~~4	~~4~~3	~~75~~80%
CCO	1. Implement continuous climb operations in conjunction with performance-based navigation (PBN)	~~5~~7	~~3~~1	100%
CDO	1. Use performance-based airspace and arrival procedures allowing an aircraft to fly its optimum profile using continuous descent operations (CDOs	~~3~~7	~~5~~1	100%
TBO	1. Implement a set of data link applications supporting surveillance and communications in air traffic service	~~6~~7	~~2~~1	100%

8. NAT ANRF-ASBU and ANRF-RASI forms

8.1 NAT ANRF ASBU

<table>
<tr><td colspan="6">NAT ASBU Air Navigation Reporting Form (NAT ANRF-ASBU)</td></tr>
<tr><td>PIA</td><td>4-Efficient Flight Path</td><td>Block - Module</td><td>B0- TBO</td><td>Date</td><td>~~June 2018~~April 2019</td></tr>
<tr><td colspan="6">Module Description
Improved Safety and Efficiency through the initial application of Data Link En-Route</td></tr>
<tr><td colspan="6">Element Implementation Status</td></tr>
<tr><td rowspan="2">1</td><td colspan="2">Element Description
Data Link Mandate (DLM) over oceanic and remote areas</td><td colspan="2">Date Planned/Implemented
Phased implementation from Feb 2013 to Jan 2020</td><td>Status
Partially implemented</td></tr>
<tr><td colspan="5">Status Details
Feb 2013 - Implemented on 3 core tracks FL350-390
Feb 2015 - Implemented on all NAT OTS FL350-390
Dec 2017 –Implemented in all NAT HLA FL350-390
Jan 2020 – Planned in all NAT above FL290
FAA Response: Status=Data Link is implemented, but no mandate by the FAA.</td></tr>
<tr><td rowspan="2">2</td><td colspan="2">Element Description
FANS 1/A</td><td colspan="2">Date Planned/Implemented</td><td>Status
N/A</td></tr>
<tr><td colspan="5">Status Details
FAA Response: Status=Implemented in 2005.</td></tr>
<tr><td rowspan="2">3</td><td colspan="2">Element Description</td><td colspan="2">Date Planned/Implemented</td><td>Status</td></tr>
<tr><td colspan="5">Status Details</td></tr>
<tr><td rowspan="2">4</td><td colspan="2">Element Description</td><td colspan="2">Date Planned/Implemented</td><td>Status</td></tr>
<tr><td colspan="5">Status Details</td></tr>
<tr><td colspan="6">Achieved Benefits</td></tr>
<tr><td colspan="6">Access and Equity
Improved</td></tr>
<tr><td colspan="6">Capacity
Increased</td></tr>
<tr><td colspan="6">Efficiency
Increased access to the most fuel efficient flight profile</td></tr>
<tr><td colspan="6">Environment
Less fuel burn, reduced GHG emissions</td></tr>
<tr><td colspan="6">Safety
Lateral, longitudinal and vertical risk is reduced. Reduction of coordination errors
More timely detection of errors, supporting reduced time at unprotected profile
More accurate position reports and automated processing of position reports. Support normal flight tracking capability.</td></tr>
<tr><td colspan="6">Implementation Challenges</td></tr>
</table>

Ground system Implementation
Avionics Implementation FANS 1/A equipage is required
Procedures Availability
Operational Approvals Operators need to obtain PBCS and data link approvals, where applicable
Notes

NAT ASBU Air Navigation Reporting Form (NAT ANRF-ASBU)					
PIA	2-Globally interoperable system and data	**Block - Module**	B0-FICE	**Date**	~~June 2018~~April 2019
Module Description *Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration*					
Element Implementation Status					
1	**Element Description** *AIDC to provide initial flight data to adjacent ATSUs*		**Date Planned/Implemented** *2013*		**Status** *implemented*
	Status Details				
2	**Element Description** *AIDC to update previously coordinated flight data*		**Date Planned/Implemented** *2013*		**Status** *Partly implemented*
	Status Details *Iceland planned implementation ~~2019~~2020* *Fully implemented in Portugal* *FAA Response: Status=Implemented. Updating of data is performed in the AIDC coordination functionality. The United States updates AIDC flight data within system messaging in all of their interfaces with adjacent FIRs. This falls within the coordination phase of AIDC.*				
3	**Element Description** *AIDC for control transfer*		**Date Planned/Implemented** *Note 1*		**Status** *Note 1*
	Status Details Iceland is not planning to implement Element 3 FAA Response: Status=Implemented. AIDC protocols as implemented within the United States ATOP system supports the notification, coordination and specifically the transfer of communications and control phases as defined in bilateral agreements between the United States and interfaced ATSUs.				
4	**Element Description** *AIDC to transfer CPDLC logon information to the Next Data Authority*		**Date Planned/Implemented** *Note 1*		**Status** *Note 1*
	Status Details *Iceland is not planning to implement Element 4* *FAA Response: Status=Planning. The US is not scheduled to support this capability until 2020 when AIDC Version 3.0 is projected for implementation.*				
Achieved Benefits					
Access and Equity Improved					
Capacity Increased					
Efficiency Increased access to the most fuel efficient flight profile					
Environment Less fuel burn, reduced GHG emissions					
Safety *Reduction of coordination errors* More timely detection of errors, supporting reduced time at unprotected profile					
Implementation Challenges					

Ground system Implementation Automation upgrades for full AIDC capability
Avionics Implementation
Procedures Availability
Operational Approvals
Notes 1 Elements 3 and 4 will probably not be implemented.

NAT ASBU Air Navigation Reporting Form (NAT ANRF-ASBU)						
PIA	3-Optimum capacity and flexible flights	**Block - Module**	B0- ASUR	**Date**	~~June 2018~~April 2019	
Module Description *Initial capability for ground surveillance*						
Element Implementation Status						
1	**Element Description** *ADS-B*			**Date Planned/Implemented** *Phased implementation from 2010 to 2020*		**Status** *Partially implemented*
	Status Details *2010-Ground based ADS-B services provided from 6 sites in Canada and 4 sites in Greenland* *2011- 8 ADS-B stations installed in Iceland at 8 sites, 4 ADS-B stations installed in the Faroe Islands at two sites, 10 ADS-B stations installed in Greenland at 5 sites. 11 ADS-B stations installed in the central group of the Azores Islands at 11 sites* *2014 - ADS-B services implemented in Iceland.6 ADS-B stations installed in the western group of the Azores Islands at 6 sites* *~~2018~~ 2019 - 1 ADS-B station to be installed in the eastern group of the Azores Islands at 1 site* *2018 – 1 ADS-B station installed in Madeira archipelago* *2019 – ADS-B stations to be installed in Portugal mainland allowing surveillance coverage along the FIR boundaries between Santa Maria and Lisboa/Madrid* *2019 - Space based ADS-B services to be implemented as a trial in Shanwick and Gander* *FAA Response: Status=Implemented. The ADS-B surveillance coverage for the continental United States is completed in 2014. Update on April 16, 2019: The ADS-B OUT mandate starts on January 1, 2020 to fly in most controlled airspace (Class B & C and above 10,000 feet, for example) For more detail, visit www.faa.gov/nextgen/equipadsb/.*					
2	**Element Description** *Multilateration(MLAT)*			**Date Planned/Implemented**		**Status**
	Status Details *2011- 11 MLAT stations installed in the central group of the Azores Islands at 11 sites* *2014 - 6 MLAT stations installed in the western group of the Azores Islands at 6 sites* *2019 –MLAT, as part of ATS Surveillance service in Iceland, implemented within the approach area for BIRK and BIKF (60NM radius from BIKF)* *FAA Response: Status=Implemented. Note from December 2013: The FAA has implemented ADS-B and surface multilateration called ASDE-X at 35 aerodromes. The list of 35 aerodromes are below:* *KATL KCLT KDTW KBOS KMEM KMDW KPDX* *KORD KIAH KJFK KMIA KSLC KFLL KCLE* *KDFW KPHL KMSP KIAD KMCO KSAN KSTL* *KDEN KPHX KSFO KLGA KDCA KTPA KCVG* *KLAX KLAS KEWR KSEA KBWI KHNL KPIT* *The FAA has implemented of Wide Area Multilateration (WAM) in Juneau (JNU) in Alaska and Telluride, Montrose, Gunnison, Durango, Rifle and Hayden in Colorado.*					
3	**Element Description**			**Date Planned/Implemented**		**Status**
	Status Details					
4	**Element Description**			**Date Planned/Implemented**		**Status**

	Status Details		
5	**Element Description**	**Date Planned/Implemented**	**Status**
	Status Details		

Achieved Benefits
Access and Equity Improved
Capacity Increased
Efficiency Increased access to the most fuel efficient flight profile
Environment Less fuel burn, reduced GHG emissions
Safety Provide for surveillance capability in oceanic airspace. Provides for normal flight tracking capability and location of aircraft in distress.
Implementation Challenges
System Implementation Timely availability of SB ADS-B system and completion of standardisation work
Avionics Implementation
Procedures Availability
Operational Approvals
Notes

<table>
<tr><td colspan="6">NAT ASBU Air Navigation Reporting Form (NAT ANRF-ASBU)</td></tr>
<tr><td>PIA</td><td>2-Globally interoperable system and data</td><td>Block - Module</td><td>B0- ATM</td><td>Date</td><td>~~June 2018~~April 2019</td></tr>
<tr><td colspan="6">Module Description
Service Improvement through Digital Aeronautical Information Management.</td></tr>
<tr><td colspan="6">Element Implementation Status</td></tr>
<tr><td rowspan="2">1</td><td colspan="2">Element Description
Aeronautical Information Exchange Model (AIXM)</td><td colspan="2">Date Planned/Implemented
Dec 2018</td><td>Status
Partially implemented</td></tr>
<tr><td colspan="5">Status Details
Iceland fully compliant .
Portugal plans to be fully compliant by end of 2020
FAA Response: Status=Implemented. Comment from 2013: The introduction of digital processing and digital management of information using the aeronautical information exchange model (AIXM) has been initiated, but not complete. The FAA currently provides a subset of Aeronautical Information in AIXM including digital NOTAM in AIXM 5.1. Comment on April 16 2019: The FAA knows how to use AIXM and has been demonstrated. The FAA operates multiple systems that can use AIXM and will convert those systems to use AIXM as we update them. We consider this capability is implemented and will not keep track of each and all systems within the FAA. However we will ensure that our systems to be interoperable with other states' systems where AIXM should be used for the communication.</td></tr>
<tr><td rowspan="2">2</td><td colspan="2">Element Description
eAIP</td><td colspan="2">Date Planned/Implemented
Dec 2018</td><td>Status
Partially implemented</td></tr>
<tr><td colspan="5">Status Details
Iceland fully compliant.
Portugal eAIP fully implemented
FAA Response: Status=Implemented. An HTML version of eAIP is available via https://www.faa.gov/air_traffic/publications/.</td></tr>
<tr><td rowspan="2">3</td><td colspan="2">Element Description
Digital NOTAM</td><td colspan="2">Date Planned/Implemented
Dec 2016</td><td>Status
Partially implemented</td></tr>
<tr><td colspan="5">Status Details
Iceland planned to be fully compliant by end of 2023~~.~~
Portugal plans to be fully compliant by end of 2020
FAA Response: Status=Implemented. Comments on December 2013: Digital NOTAM has been implemented. More than 400 airports are capable of producing Digital NOTAM. Update Comments on June 12, 2018 - The legacy (analog) United States NOTAM system (USNS) is migrating to the digital Federal NOTAM System (FNS), with FNS now generating around 80% of NOTAMs digitally. The new system has SWIM connectivity, resulting in improvements to efficiency and safety for airspace users. FNS allows for the automatic transformation from the US NOTAM format to ICAO and plain language formats. It uses business rules for validation and allows for information exchange by using AIXM 5.1 format.</td></tr>
<tr><td>4</td><td colspan="2">Element Description
eTOD</td><td colspan="2">Date Planned/Implemented
Dec 2018</td><td>Status
Partially implemented~~Need Analysis Not Started~~</td></tr>
</table>

	Status Details *Iceland fully compliant.* *Portugal plans to be fully compliant by end of ~~2017~~2020* *FAA Response: Status=Implemented. Comments on December 2013: Currently providing point data in NAD83/NAVD88. Plans in place to provide AIXM 5.1 obstacle point data in WGS-84. Update Comments on June 12, 2018 - The majority of eTOD related terrain collection is the responsibility of the United States Geologic Survey (USGS) and is available for download from their website, free of charge.*		
5	**Element Description** *WGS-84*	**Date Planned/Implemented** Sep 2015	**Status** *Implemented*
	Status Details *Iceland fully compliant.* *Portugal fully compliant*		
6	**Element Description** *QMS for AIM*	**Date Planned/Implemented** Sep 2015	**Status** *Implemented*
	Status Details *Iceland fully compliant.* *Portugal QMS implemented*		
Achieved Benefits			
Access and Equity Improved			
Capacity Increased			
Efficiency Increased			
Environment Less fuel burn, reduced GHG emissions			
Safety *Improved*			
Implementation Challenges			
System Implementation			
Avionics Implementation			
Procedures Availability			
Operational Approvals			
Notes			

<table>
<tr><td colspan="6">NAT ASBU Air Navigation Reporting Form (NAT ANRF-ASBU)</td></tr>
<tr><td>PIA</td><td>2-Globally interoperable system and data</td><td>Block - Module</td><td>B0- AMET</td><td>Date</td><td>Sep 2016</td></tr>
<tr><td colspan="6">Module Description
Meteorological information supporting enhanced operational efficiency and safety</td></tr>
<tr><td colspan="6">Element Implementation Status</td></tr>
<tr><td rowspan="2">1</td><td colspan="3">Element Description
WAFS</td><td>Date Planned/Implemented
SADIS FTP
(1 September 2015)</td><td>Status
Implemented</td></tr>
<tr><td colspan="5">Status Details
Secure SADIS FTP is implemented</td></tr>
<tr><td rowspan="2">2</td><td colspan="3">Element Description
IAVW</td><td>Date Planned/Implemented
Sep 2015</td><td>Status
Implemented</td></tr>
<tr><td colspan="5">Status Details
• (Canada, France United Kingdom, United States) All VAACS issue fully compliant volcanic ash advisory (VAA) and volcanic ash advisory information in graphical format (VAG)
• (Iceland, Portugal) All volcanic observatories issue fully compliant volcano observatory notice for aviation (VONA)</td></tr>
<tr><td rowspan="2">3</td><td colspan="3">Element Description
TCAC forecasts</td><td>Date Planned/Implemented
Sep 2015</td><td>Status
Implemented</td></tr>
<tr><td colspan="5">Status Details
The TCAC issues fully compliant tropical cyclone advisory (TCA) and tropical cyclone advisory in graphical format (TCG).</td></tr>
<tr><td rowspan="2">4</td><td colspan="3">Element Description
Aerodrome warnings</td><td>Date Planned/Implemented</td><td>Status
Need Analysis Not Started</td></tr>
<tr><td colspan="5">Status Details
FAA Response: Status=Implemented. Airport weather warnings are issued for US civil airports by the National Weather Service (NWS) Weather Forecast Offices (WFOs) based on agreed airport warning criteria and dissemination procedures.</td></tr>
<tr><td rowspan="2">5</td><td colspan="3">Element Description
Wind shear warnings and alerts</td><td>Date Planned/Implemented</td><td>Status
Need Analysis Not Started</td></tr>
<tr><td colspan="5">Status Details
FAA Response: Status=Implemented. Wind shear warnings and alerts are provided for major civil airports. Over 120 US airports have ground-based wind shear detecting systems installed. These systems included the Low Level Wind Shear System (LLWS) and the Terminal Doppler Weather Radar (TDWR) as an input component of the Integrated Terminal Weather System (ITWS).</td></tr>
<tr><td rowspan="2">6</td><td colspan="3">Element Description
SIGMET</td><td>Date Planned/Implemented
Nov 2018</td><td>Status
Partially Implemented</td></tr>
<tr><td colspan="5">Status Details
Not all States issue fully compliant SIGMET
For the NAT, the target level of performance is:
- 98% of SIGMETs coded in compliance with Annex 3 SARPs
FAA Response: Status=Implemented. The NWS provides SIGMETs for all US controlled airspace in compliance with ICAO Annex 3 with filed State exceptions as well as supporting NWS, FAA or DoD publications.</td></tr>
<tr><td>7</td><td colspan="3">Element Description
Other OPMET information (METAR, SPECI and/or TAF)</td><td>Date Planned/Implemented</td><td>Status
Partially Implemented</td></tr>
</table>

	Status Details For the NAT, the target level of performance is: - 95% of required METAR disseminated within 5 minutes of METAR observation time - 95% of required TAF disseminated within 35 minutes (30 minutes lead time plus 5 minutes transit time) FAA Response: Status=Implemented. The NWS issues TAFS for all major civil airports and METAR/SPECI reports are provided at all major airports by the NWS, FAA, Department of Defense (DoD), or other local or state authorities. The TAFS and METAR/SPECI reports are provided in compliance with ICAO Annex 3 with filed State exceptions.		
8	**Element Description** *QMS for MET*	**Date Planned/Implemented** Sep 2015	**Status** *Implemented*
	Status Details		
Achieved Benefits			
Access and Equity Improved			
Capacity Increased			
Efficiency *Increased*			
Environment Less fuel burn, reduced GHG emissions			
Safety Improved			
Implementation Challenges			
System Implementation			
Avionics Implementation			
Procedures Availability			
Operational Approvals			
Notes			

NAT ASBU Air Navigation Reporting Form (NAT ANRF-ASBU)					
PIA	3-Optimum capacity and flexible flights	**Block - Module**	B1- FRTO	**Date**	June 2018

Module Description *Implementation of reduced longitudinal separation minima*			
Element Implementation Status			
1	**Description** *RLongSM Validation Trial*	**Date Planned/Implemented** *2010*	**Status** *Implemented*
	Status Details *Applied between eligible pairs (FANS 1/A CPDLC /ADS-C (RCP240/RSP180 measured)) in Gander, Shanwick and Reykjavik OCA)*		
2	**Element Description** *PBCS*	**Date Planned/Implemented** *March 2018*	**Status** *Implemented*
	Status Details *Upgrade ground automation systems to process PBCS designators- Done* *Establish and implement the PBCS approval process-Done*		
3	**Element Description** *5 minutes longitudinal separation*	**Date Planned/Implemented** *March 2018*	**Status** *Implemented*
	Status Details *Implemented in accordance with the new PANS-ATM separation minima applicable from Nov 2016.*		
4	**Element Description**	**Date Planned/Implemented**	**Status**
	Status Details		
5	**Element Description**	**Date Planned/Implemented**	**Status**
	Status Details		
Achieved Benefits			
Access and Equity Improved			
Capacity Increased			
Efficiency Increased access to the most fuel efficient flight profile			
Environment Less fuel burn, reduced GHG emissions			
Safety Lateral, longitudinal and vertical risk do not increase			
Implementation Challenges			
Ground system Implementation Ground automation systems need to be updated			
Avionics Implementation FANS 1/A is required for PBCS separation.			
Procedures Availability			

Operational Approvals Operators need to obtain PBCS and PBN approvals
Notes *Detailed information is provided in the NAT RlongSM, RLatSM, PBCS implementation plans and tasks list. Visit http://www.icao.int/EURNAT/Pages/EUR-and-NAT-Document.aspx?RootFolder=%2FEURNAT%2FEUR%20and%20NAT%20Documents%2FNAT%20Documents%2FPlanning%20documents%20supporting%20separation%20reductions%20and%20other%20initiatives&FolderCTID=0x012000DAF95319EADD9946B510C5D7B595637D00AA5EB47B299B9A4BAD1968B24E18655C&View={2666E7DD-5F4E-4E64-B16A-CF142A1E5BC9}*

NAT ASBU Air Navigation Reporting Form (NAT ANRF-ASBU)					
PIA	3-Optimum capacity and flexible flights	**Block - Module**	B1- FRTO	**Date**	June 2018
Improvement Description *Implementation of reduced lateral separation minima*					
Element Implementation Status					
1	**Element Description** *RLatSM validation trial Phase 1*	**Date Planned/Implemented** *Dec 2015*		**Status** *Implemented*	
	Status Details *Applied on 3 core tracks in Gander, Shanwick and Reykjavik OCA. RNP 4 and FANS 1/A CPDLC /ADS-C (RCP240/RSP180 measured) are required*				
2	**Element Description** *RLatSM validation trial Phase 2*	**Date Planned/Implemented** *Nov 2016*		**Status** *Implemented*	
	Status Details *Applied on all NAT OTS in Gander, Shanwick and Reykjavik OCA. RNP 4 and FANS 1/A CPDLC /ADS-C (RCP240/RSP180 measured) are required*				
3	**Element Description** *23 NM reduced lateral separation*	**Date Planned/Implemented** *March 2018*		**Status** *Implemented*	
	Status Details *Upgrade ground automation systems to process PBCS designators- ongoing* *Establish and implement the PBCS approval process*- ongoing				
4	**Element Description** *23 NM reduced lateral separation*	**Date Planned/Implemented** *March 2018*		**Status** *Implemented*	
	Status Details *Obtaining RNP 4 approvals ongoing. Equipage is increasing*				
5	**Element Description** *23 NM reduced lateral separation*	**Date Planned/Implemented** *March 2018*		**Status** *Implemented*	
	Status Details *Applied in New York Eats and Santa Maria OCAs, and on all NAT OTS in Gander, Shanwick and Reykjavik OCAs. RNP 4 and FANS 1/A CPDLC /ADS-C (RCP240/RSP180) are required*				
Achieved Benefits					
Access and Equity Improved					
Capacity *Increased*					
Efficiency Increased access to the most fuel efficient flight profile					
Environment Less fuel burn, reduced GHG emissions					
Safety Lateral, longitudinal and vertical risk do not increase					

Implementation Challenges
Ground system Implementation Ground automation systems need to be updated
Avionics Implementation RNP 4 and FANS 1/A equipage is required for the lateral reduction of separation minima.
Procedures Availability
Operational Approvals Operators need to obtain PBCS and PBN approvals
Notes *Detailed information is provided in the NAT RlongSM and RLatSM implementation plans and tasks list. Visit http://www.icao.int/EURNAT/Pages/EUR-and-NAT-Document.aspx?RootFolder=%2FEURNAT%2FEUR%20and%20NAT%20Documents%2FNAT%20Documents%2FPlanning%20documents%20supporting%20separation%20reductions%20and%20other%20initiatives&FolderCTID=0x012000DAF95319EADD9946B510C5D7B595637D00AA5EB47B299B9A4BAD1968B24E18655C&View={2666E7DD-5F4E-4E64-B16A-CF142A1E5BC9}*

8.2 NAT ANRF RASI

NAT RASI Air Navigation Reporting Form (NAT ANRF-RASI)			
RASI # - Title	Greenland ATM Improvement Program	**Date**	June 2018
Improvement Description The Greenland ATM Improvement Program applies to the airspace in the Nuuk FIR north of 6330N between F195 and F285. Traffic in this airspace is mostly domestic traffic in Greenland as well as international traffic to/from airports in Greenland. The applicable separation standards have for the most part been 120 NM lateral separation and 30 minutes longitudinal separation which has precluded efficient operations in the airspace. The aim of the Greenland ATM Improvement Program is implementation of new and improved procedural separation standards, introduction of ADS-B surveillance services and Direct Controller Pilot (DCPC) VHF voice communications.			

Element Implementation Status

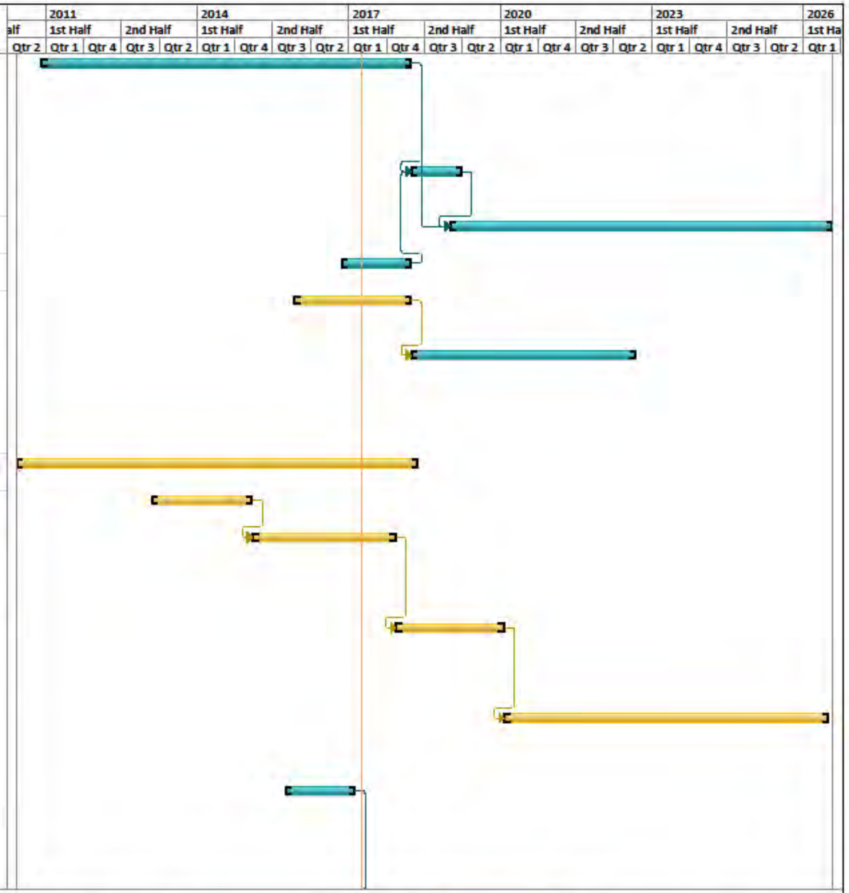
1	**Description** Operational trial of 20 NM lateral separation between GNSS equipped aircraft climbing/descending through the level of other GNSS equipped aircraft.	**Date Planned/Implemented** 2013	**Status** Implemented
	Status Details		
2	**Description** Implementing 15 minutes longitudinal separation between other than turbojet aircraft using third party VHF communication.	**Date Planned/Implemented** 2013	**Status** Implemented
	Status Details		
3	**Description** Implementing 15 minutes longitudinal separation between other than turbojet aircraft using DCPC VHF communication.	**Date Planned/Implemented** 2015	**Status** Implemented
	Status Details		
4	**Description** Implementing 15 NM lateral separation between GNSS equipped aircraft in DCPC VHF voice communication.	**Date Planned/Implemented** 2015	**Status** Implemented
	Status Details		
5	**Description** Implementing 7 NM lateral separation between GNSS equipped aircraft in DCPC VHF voice communication and climbing/descending through the level of other GNSS equipped aircraft	**Date Planned/Implemented** 2015	**Status** Implemented
	Status Details		
6	**Description** Implementing ADS-B surveillance separation of 10 NM	**Date Planned/Implemented** 2015	**Status** Implemented

	Status Details		
7	**Description** Application of "traditional" PANS-ATM procedural separation between aircraft in DCPC VHF voice communication.	**Date Planned/Implemented** 2016	**Status** Implemented
	Status Details		
8	**Description** Implementing all the Greenland ATM Improvement program separation rules, both lateral and longitudinal in BIRD FIR	**Date Planned/Implemented** 2017	**Status** Implemented
	Status Details		

Achieved Benefits
Access and Equity Improved
Capacity Increased
Efficiency Increased access to the most fuel efficient flight profile
Environment Less fuel burn, reduced GHG emissions
Safety No increase in safety risk
Implementation Challenges
Ground system Implementation
Avionics Implementation
Procedures Availability
Operational Approvals
Notes

9. NAT SDR

ID		Task Mode	Task Name	Duration	Start	Finish	Predecessors
1			RLongSM Trial - Initial phase applied between eligible pairs (Gander & Shanwick, all HLA levels, FANS 1/1 CPDLC & ADS-C required (IMP Plan Ref.)	1912 days	Wed 12/1/10	Thu 3/29/18	
2			5 min LongSM (Doc 4444.RCP240/RSP180 reqd)	262 days	Thu 3/29/18	Fri 3/29/19	1,4
3			5 min LongsSM Next Phase (TBD)	1980 days	Tue 1/1/19	Sat 8/1/26	1,2
4			RLongSM Trial - Initial phase - Reykjavik	361 days	Thu 11/10/16	Thu 3/29/18	
5			UM137/DM40 automated impl + CPDLC route clearance	607 days	Wed 12/2/15	Thu 3/29/18	
6			Discontinuation of OCL	1162 days	Fri 3/30/18	Mon 9/12/22	5
7			Implementation SATVOICE	2076 days	Wed 6/2/10	Wed 5/16/18	
8			FANS 1/A DLM Phase 1 - 2 core tracks FL360 - 390	521 days	Thu 2/7/13	Thu 2/5/15	
9			FANS 1/A DLM Phase 2a - All OTS FL350 - 390 (areas of ATS surv & VHF voice, above 80N and New York excl)	741 days	Thu 2/5/15	Thu 12/7/17	8
10			FANS 1/A DLM Phase 2b - all HLA FL350 - 390 (areas of ATS surv & VHF voice, above 80N and New York excl)	561 days	Thu 12/7/17	Thu 1/30/20	9
11			FANS 1a DLM Phase 2c - all airspace above 290 (areas of ATS surv & VHF voice, above 80N	1677 days	Thu 1/30/20	Fri 7/3/26	10
12			RLatSM Ph 1 (Gander & Shanwick) - 3 core tracks, FL350 - 390, FANS 1/A+RNP4, RCP240/RSP180 monitored	360 days	Thu 10/1/15	Wed 2/15/17	



Project: NAT SDR
Date: Fri 4/7/17

Task · Split · Milestone · Summary · Project Summary · External Tasks · External Milestone · Inactive Task · Inactive Milestone · Inactive Summary · Manual Task · Duration-only · Manual Summary Rollup · Manual Summary · Start-only · Finish-only · Deadline · Progress

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APPENDIX P — AMENDMENTS TO NAT SPG HANDBOOK (NAT DOC 001, V2.4.0, JUNE 2019)

(*paragraphs 5.3.3 and 5.3.5 refer*)

STARTS ON NEXT PAGE

European and North
Atlantic Office

NAT Doc 001

NAT SPG HANDBOOK

Second Edition

~~Version 2.3.0 – June 2018~~Version 2.4.0 – June 2019

~~Approved by NAT SPG/54~~Approved by NAT SPG/55

Prepared by the ICAO European and North Atlantic Office

on behalf of the North Atlantic Systems Planning Group (NAT SPG)

EUROPEAN AND NORTH ATLANTIC OFFICE OF ICAO

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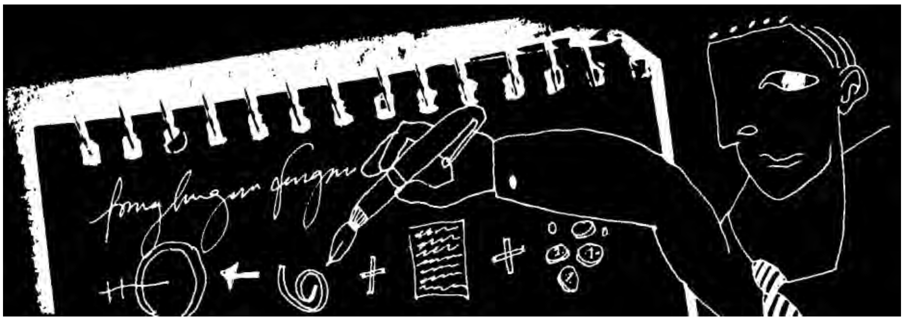
6 — REFERENCE DOCUMENTATION



And so while the great ones depart for their dinner
The secretary stays, growing thinner and thinner
Racking his brain to record and report
What he thinks that they think that they ought to have thought.

(Anstey)

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RECORD OF AMENDMENTS

~~**As of July 2011, the *NAT SPG Handbook* is published as**~~

~~***1st Edition, July 2011 introduced the following changes (NAT SPG Conclusion 47/13 refers)***~~

- ~~NAT Fast Track Procedure for Safety Occurrences added, to follow the Safety Policy Statement (NAT SPG Conclusion 47/08 refers)~~
- ~~Agenda supporting meetings of the NAT SPG updated (*Summary of Discussions and Conclusions of the 47th Meeting of the NAT SPG*, paragraph 6.4.4 refers)~~
- ~~List of NAT SPG documents updated and moved to the References section (*Summary of Discussions and Conclusions of the 47th Meeting of the NAT SPG*, paragraph 6.4.8 refers)~~
- ~~Terms of Reference for the NAT SOG, NAT SG, NAT MWG and NAT CMA updated (NAT SPG Conclusion 47/10 refers)~~
- ~~Policy conclusion regarding the implementation of the NAT Region Data Link Mandate, superseding NAT SPG Conclusion 41/7, added to "Implementation of Data Link" (NAT SPG Conclusion 46/02 refers)~~
- ~~Policy conclusion regarding the vertical and horizontal limits of the NAT Region Data Link Mandate airspace added to "Implementation of Data Link" (NAT SPG Conclusion 47/01 refers)~~
- ~~Policy conclusion regarding an ADS-B eligibility list for the ICAO NAT Region added to "Safety Related Policies" (NAT SPG Conclusion 47/06 refers)~~
- ~~Policy conclusion regarding an updated concept of operations to support RLatSM, superseding NAT SPG Conclusion 45/10, added to "Implementation Planning" (NAT SPG Conclusion 47/02 refers)~~
- ~~Policy conclusion regarding the TLS to support reductions in lateral separation added to "Implementation Planning" (NAT SPG Conclusion 47/04 refers)~~
- ~~Policy conclusion regarding the endorsement of the *NAT RCP and ADS-C surveillance performance based operations implementation plan* added to "Implementation Planning" (NAT SPG Conclusion 47/05 refers)~~
- ~~Policy conclusions 27/22 and 33/6 supporting reductions in vertical and longitudinal separation, respectively, added to "Implementation Planning" (*Summary of Discussions and Conclusions of the 47th Meeting of the NAT SPG*, paragraph 6.4.7 refers)~~
- ~~Policy conclusions, 41/7, 45/10 and 43/31, which are no longer extant, and policy conclusions 45/13, 45/29 and 45/30, which are no longer considered necessary for inclusion deleted (*Summary of Discussions and Conclusions of the 47th Meeting of the NAT SPG*, paragraph 6.4.5 refers)~~
- ~~Policy conclusion regarding the adoption of the GOLD added to "NAT Documentation" (NAT SPG Conclusion 46/8 refers)~~
- ~~Editorial corrections~~

~~***Amendment 1, June 2012, introduced the following changes (NAT SPG Conclusion 48/23 refers)***~~

- ~~*Record of Amendments* added (*Summary of Discussions and Conclusions of the 48th Meeting of the NAT SPG*, paragraph 6.1.1 refers)~~
- ~~Reference to NAT SPG Conclusion 45/3 added to *Conduct of the meetings of the NAT SPG groups and sub-groups*~~
- ~~*Formulation of Recommendations to the NAT SPG* added (NAT SPG Conclusion 48/12 refers)~~
- ~~Ireland and United States NAT SPG representatives updated~~
- ~~Composition of NAT EFG updated (*Summary of Discussions and Conclusions of the 48th Meeting of the NAT SPG*, paragraph 5.1.20 refers)~~
- ~~*Inputs from NAT IMG Contributory Groups* added to "The NAT IMG Contributory Groups" (NAT IMG Decision 40/24 refers)~~
- ~~*Terms of Reference for the NAT OPS/AIR sub-group* updated (NAT IMG Decision 40/31 refers)~~
- ~~*Terms of Reference for the NAT SOG* updated (NAT SPG Conclusion 48/18 b) refers)~~
- ~~"The NAT SOG Contributory Groups" added (NAT SOG Decision 06/01 refers)~~
- ~~NAT SPG Conclusion 48/10 added to *Implementation of Data Link*~~
- ~~NAT SPG Conclusions 48/18 and 48/21 added to *Safety Related Policies*~~
- ~~NAT SPG Conclusion 47/2 replaced by NAT SPG Conclusion 48/2 in *Implementation Planning*~~
- ~~Explanatory Notes added to NAT SPG Conclusion 47/5 in *Implementation Planning*~~
- ~~NAT SPG Conclusion 48/7 added to *Implementation Planning*~~
- ~~Explanatory Note added to NAT SPG Conclusion 44/38 in *NAT Documentation*~~
- ~~*List Of Documents Promulgated by the NAT SPG* updated (*Summary of Discussions and Conclusions of the 48th Meeting of the NAT SPG*, paragraph 6.1.1 refers)~~
- ~~*Detailed Oceanic Event Reports Content* added (NAT SPG Conclusion 48/19 refers)~~

~~***Amendment 2, June 2013, introduced the following changes***~~

- ~~NAT SPG observers *(NAT SPG Conclusion 49/27 & NATSPG/49 Report Appendix Q refer)*~~
- ~~NAT Doc 008 management *(NAT SPG/49 Report paragraph 6.3.6 refers)*~~
- ~~Process for the nomination/review of chairmanship/rapporteurship of the NAT SPG and its Contributory Groups and updates to Terms of Reference of NAT SPG and its Contributory Bodies NAT SPG Chairman and Vice-Chairman *(NAT SPG Conclusion 49/27 & NATSPG/49 Report Appendix R refer)*~~
  - ~~Conduct of the meetings – Vice-Chairman *(NAT SPG Conclusion 49/27 & NATSPG/49 Report Appendix R refer)*~~
  - ~~Election of Chairmen/vice/chairmen/Rapporteurs of NAT SPG and contributory groups~~
  - ~~Guidelines for basic requirements for Chairmen/Vice-Chairmen/Rapporteurs~~
- ~~France, Norway and United Kingdom NAT SPG representatives updated~~
- ~~Updates to Terms of Reference of the NAT SPG and its Contributory Groups *(NAT SPG Conclusion 49/27 & NATSPG/49 Report App S refer)*~~
- ~~NAT SPG Conclusion 49/02 – Amendments to the list of safety key performance indicators for the ICAO NAT Region – *added*~~
- ~~NAT SPG Conclusion 48/18 ,a) – *amended, as a consequence of NAT SPG Conclusion 49/02*~~
- ~~NAT SPG Conclusion 49/05 RCP and RSP for RLatSM and RLongSM – *added*~~
- ~~NAT SPG Conclusion 49/09 – Completion of ½ degree coordinates hazard analysis – *added*~~
- ~~NAT SPG Conclusion 45/22 – *removed, as a consequence of NAT SPG Conclusion 49/09*~~
- ~~NAT SPG Conclusion 49/13 – Acceptability of I4 Classic Aero sub-network for FANS 1/A data link services – *added*~~
- ~~NAT SPG Conclusion 49/19 – Mapping of the NAT SDR with the ICAO GANP/ASBU – *added;* as a consequence, NAT Doc 009, *Service Development Roadmap – North Atlantic Region* has been published and *added to* the list of *NAT documents promulgated by the NAT SPG*~~
- ~~Satellite Voice Guidance Material (SVGM) – *added to* the list of *NAT documents promulgated by the NAT SPG*~~
- ~~Editorial corrections~~

~~*Amendment 3, June 2014, introduced the following changes*~~

- ~~Canada's representative – *updated*~~
- ~~France's representative – *updated*~~
- ~~Norway's representative – *mail address updated*~~
- ~~United Kingdom's CAA representative – *updated*~~
- ~~Procedure for Processing of PfAs to the SUPPs – *added* (NAT SPG Conclusion 50/15)~~
- ~~NAT Fast Track Procedure – *updated* (NAT SPG Conclusion 50/16 refers)~~
- ~~ToRs of the NAT EFG – *updated to include provision of NAT Traffic Forecasts* (NAT SPG Conclusion 50/21 refers)~~
- ~~Composition of the NAT ATMG – *updated to invite the NAT DMO once a year* (NAT SPG Conclusion 50/22 refers)~~
- ~~NAT SPG Conclusion 50/23 – *NAT OPS/AIR related updates*~~
  - ~~*Diagram of the NAT SPG working structure adapted*~~
  - ~~*NAT OPS/AIR ToRs moved under the NAT CNSG related pages of the document*~~
  - ~~*NAT OPS/AIR ToRs updated*~~
  - ~~*Miscellaneous consistency related corrections*~~
- ~~Reference documentation:~~
  - ~~*Updated: OESB and SOC to become NAT OES Bulletins and Bulletin Supplements* (NAT SPG Conclusion 50/24 refers)~~
  - ~~*Removed: North Atlantic International General Aviation Operations Manual - included in NAT Doc 007, since Edition 2013 Amendment 1* (NAT SPG Conclusion 49/23 refers)~~
- ~~NAT CMA – *updated ToRs* (NAT SPG Conclusion 50/30)~~
- ~~NAT DLMA – *updated ToRs to include Part I (priority 1) aspects* (NAT SPG Conclusion 50/31)~~
- ~~Running headers and footers~~
- ~~Editorial corrections~~

As of December 2015, the *NAT SPG Handbook* is published as

2nd Edition, V2.0.0, December 2015, introduced the following changes*

- Update to Canada's representatives
- Updates to Terms of Reference (ToR):
  - NAT IMG (*NAT SPG Conclusion 51/01* & *NATSPG/51 Report*, Appendix B refer*);*
  - NAT EFFG (*NAT SPG Conclusion 51/02* & *NATSPG/51 Report*, Appendix E refer);
  - NAT MWG (*NAT SPG Conclusion 51/03* & *NATSPG/51 Report*, Appendix F refer).
- Removal of mention of NAT TFG, replaced by NAT EFFG where referenced (*NAT SPG Conclusion 51/02* & *NATSPG/51 Report*, Appendix E refer);
- Update to NAT Document configuration management (*NAT SPG Conclusion 51/17* & *NATSPG/51 Report*, Appendix N and Appendix O refer);
- Update to NAT SPG policies (*NAT SPG Conclusion 51/18* & *NATSPG/51 Report*, Appendix P refer);
- Inclusion of NAT Doc 010 (*NAT SPG Conclusion 51/24* & *NATSPG/51 Report*, Appendix R refer);
- Insertion of a new section *Projects and Project Teams for the NAT SPG Working Structure* , starting at page 22, from NAT SPG agreement (*NAT SPG/52 report*, paragraphs 1.1.12 refers), and adapted from NAT IMG text (*NAT IMG47 Summary of Discussions*, paragraphs 3.7 and 3.8), (approved by NAT SPG by correspondence, silence procedure – EUR/NAT SL 15-0590.TEC refers);
- Updates to the NAT IMG working structure (*NAT IMG Decision 47/01*, with approval from NAT SPG by correspondence, silence procedure – EUR/NAT SL 15-0590.TEC refers):
  - Removal of NAT ATMG, NAT CNSG, NAT SARSIG, their contributory groups (NAT ACSG and NAT OPS/AIR), and NICE ToRs;
  - Insertion of NAT POG and NAT TIG ToRs;
  - Reference made to NAT POG instead of NAT ATMG, and NAT TIG instead of NAT CNSG, and to POG and/or TIG, as appropriate, in replacement of reference to NAT ACSG, NAT OPS/AIR, and NAT SARSIG.
- Regrouping of NAT CMA, NAT DMO, and NAT DLMA as "NAT SPG Services", starting at page 38;
- Correction to NAT CMA ToRs: the text have been corrected to be that endorsed by NAT SPG Conclusion 50/30;
- Update to the NAT SPG Working Structure, at page 13;
- Update to the following, due to NAT Doc 002 having been superseded by the "*Pan-Regional (APAC and NAT) Interface Control Document for ATS Inter-facility Data Communication (PAN ICD AIDC)*" (*NAT IMG Decision 45/6* refers, approved by correspondence):
  - *Documents promulgated by the NAT SPG* at page 52; and
  - *Status of Documents* (Appendix A).
- Editorial corrections:
  - Change of EUR/NAT Office public website: www.icao..int/EURNAT

* *The numbering scheme (*NAT SPG Conclusion 51/19 *refers), being mostly editorial, will be inserted in a future revision*

Amendment 1, V2.1.0, July 2016, introduced the following changes

- Numbering of paragraphs (*NAT SPG Conclusion 51/19* refers);
- Inclusion of IFAIMA (International Federation of Aeronautical Information Management Association) in section 1 — 3 (*NAT SPG Conclusion 52/21* refers);
- Update to Portugal's representatives, in section 1 — 15;
- Precision that project leads should be members of project supervisory body and are to report to parent group, in section1 — 14, 14.1 (*NAT SPG Conclusion 52/13* refers);
- Correction that the parent group is the one that agrees on its contributory groups' programmes, in in section 1 — 14, 14.2 a) (*NAT SPG Conclusion 52/13* refers);
- Updates to *Documents promulgated by the NAT SPG*, in section 6:A (*NAT SPG Conclusion 52/13* refers):
  - section title changed to reflect that not all documents in the section have a NAT reference;;
  - maintenance of NAT Doc 003 under NAT POG responsibility, in coordination with NAT TIG;
  - inclusion of NAT eANP volume III in the list, for future reference; and
  - precision that NAT SDR (NAT Doc 009) to eventually be discontinued once NAT eANP Volume III approved.
- As a consequence of Proposal for Amendment (PfA) EUR/NAT-S 16/02:
  - Replaced MNPS by HLA in the Terms of Reference (ToR) of the NAT SG, in section 3 — 3:D;
  - Mention of "MNPS" completed to become "MNPS / NAT HLA in Detailed Oceanic Event Reports Content, in Section 6 — 6:B; and
  - Mention of "MNPS airspace" completed to become "MNPS airspace (NAT HLA)" in Occurrence Classification Codes, in section 6 — 6:C.
- Updates to the *Status of documents promulgated by the NAT SPG*, in Appendix A (*NAT SPG Conclusion 52/13* refers);
- Inclusion of a list of acronyms.

Amendment 2, V2.2.0, June 2017, introduced the following changes [C 53/23]

- Updates in section 1 — 13: Representatives of Canada, Denmark and Portugal;
- Editorial update in section 2:A — Terms of Reference of the NAT IMG: deletion of reference to NAT SDR (NAT Doc 009) in paragraph 1, taking account of the incorporation of the NAT SDR in the ICAO NAT eANP Volume III (*NAT SPG Conclusion 53/21* refers);
- Updates in section 4:A — Terms of Reference of the CMA (*NAT SPG Conclusion 53/9* refers);
- Updates in section 5:A — *Safety Related Policies*:
  - Updates to 5:A — [02] *List of safety key performance indicators for the ICAO NAT Region* (*NAT SPG Conclusion 53/15* refers); and
  - Insertion of 5:A — [04] *Definition and Components of safety cases in support of changes to the NAT air navigation system requiring NAT SPG approval* (*NAT SPG Conclusion 53/16* refers);
- In section 5:B — *Implementation Planning Policies*: deletion of *[17] Mapping of the NAT SDR with the ICAO GANP/ASBU (C 49/10)*, taking account of the incorporation of the NAT SDR in the ICAO NAT eANP Volume III (*NAT SPG Conclusion 53/21* refers);
- In section 6:A — *Documents promulgated by the NAT SPG* (*NAT SPG Conclusion 53/22* refers):
  - change to format of table and deletion of Appendix A *Status of documents*;
  - clarifications on definition of NAT bulletins (NAT OPS bulletins and NAT OESB) in "Remarks" column in order to avoid duplication with provisions in NAT Doc 007;
  - updates to the status of the following documents:
    - NAT Doc 001 – *NAT SPG Handbook* – to be issued in June 2017 (*NAT SPG Conclusion 53/22* refers);
    - NAT Doc 008 – *NAT Application of Separation Minima* (ASM) – approved by NAT IMG (NAT IMG Decision 50/6 refers) and supported by the NAT SOG/16 (NAT SOG/16 SoD, paragraph 4.32 refers) and issued in June 2017;
    - NAT Doc 009 – NAT Service Development Roadmap (SDR) – discontinued as it has been integrated into the NAT eANP Volume III Companion Document, *NAT Global Air Navigation Plan (GANP) Aviation System Block Upgrades (ASBU) Report* (*NAT SPG Conclusion 53/21* refers), and
    - NAT OPS Bulletin 2017_002 – OESB – *NAT Oceanic Errors Safety Bulletin* – approved by NAT SOG/15 (NAT SOG Decision 15/4 refers) and issued in January 2017; and
- New Appendix A: ICAO High Seas Coordination Procedure (*NAT SPG Conclusion 53/23* refers).

Amendment 3, V2.3.0, June 2018, introduced the following changes [C 54/12 & 54/19]

- Section 1: #7 – NAT SPG duration and suggested Agenda – deleted;
- Section 1: #8 – Meeting Documentation – updated;
- Section 1: #11 – Guidelines for basic requirements for Chairmen/ vice-Chairmen/Rapporteurs – deleted;
- Section 1: #13 – NAT SPG representatives – updated;
- Section 2:B: #5 – Formulation of recommendations to the NAT IMG – updated;
- Section 3:B: #1 – Formulation of recommendations to the NAT SOG – updated;
- Section 3:C – Working Methods of NAT MWG – updated;
- Section 4:C – Terms of Reference of NAT DMO – updated;
- Section 5:A, 5:B, 5:C – NAT SPG Policies – updated;
- Section 6:A – Documents promulgated by the NAT SPG– updated;
- Section 6:B – Detailed Oceanic Event Reports Content – deleted;
- Section 6:C – Occurrence Classification Codes – deleted;
- Appendix A – High Seas Coordination Procedure – deleted; and
- Editorial and consequential updates to paragraph numbering and footnotes.

Amendment 4, V2.4.0, June 2019, introduced the following changes [C 55/19]

- Section 1: #3 – Observers – updated to include Trinidad and Tobago, EUROCONTROL and IFALDA;
- Section 1: #13 – NAT SPG representatives – updated;
- Section 2:C – Composition of NAT POG – updated to include EUROCONTROL and IFALDA;
- Section 2:D – Composition of NAT TIG – updated to include ARINC, EUROCONTROL, IFALDA, Inmarsat, Iridium and Sitaonair;
- Section 3:A – Terms of Reference of NAT SOG – updated;
- Section 3:D – Composition and Working Methods of NAT SG – updated;
- Section 4:A – Terms of Reference of NAT CMA – updated;
- Section 5:A – Safety Related Policies [02] Safety KPIs and [04] Definition and Components of Safety Cases – amended;
- In section 6:A — *Documents promulgated by the NAT SPG*, updates to the status of the following documents:
    - NAT Doc 001 – *NAT SPG Handbook* – to be issued in July 2019 (*NAT SPG Conclusion 55/19* refers);
    - NAT Doc 006 – *Air Traffic Management Operational Contingency Plan – North Atlantic Region – Version 1.12* – to be issued in July 2019 (*NAT SPG Conclusion 55/20* refers);
    - NAT Doc 007 – *North Atlantic Operations and Airspace Manual* – Version V 2019-3 – to be issued in July 2019 (*NAT SPG Conclusion 55/21* refers);
    - NAT Doc 008 – *Application of Separation Minima – North Atlantic Region* (NAT ASM) Version 1.8 – approved by NAT IMG (NAT IMG Decision 53/7 refers) and supported by the NAT SOG/19 (NAT SOG Decision 19/07 refers) and issued in December 2018; and
    - NAT Doc 010 – *Consolidated Reporting Responsibilities Handbook – North Atlantic Region* Version June 2019 – to be issued in July 2019 (*NAT SPG Conclusion 55/23* refers).
- New Appendix A: NAT Safety Case Template inserted.

0 — INTRODUCTION

The North Atlantic Systems Planning Group (NAT SPG) was established in 1965 by the Council of ICAO as the first regional planning group. From its Terms of Reference the NAT SPG shall continuously study, monitor and evaluate the Air Navigation system in the light of changing traffic characteristics, technological advances and updated traffic forecasts.

At the 10th Air Navigation Conference, Montreal 5 - 20 September 1991, the ICAO Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) System was endorsed, and at the Limited North Atlantic Regional Air Navigation (LIM NAT RAN) Meeting, held in Cascais, Portugal 3 - 18 November 1992, the NAT SPG was tasked to develop proposals for CNS/ATM systems implementation actions as well as proposals for institutional arrangements.

In order to meet these new challenges, a Meeting of North Atlantic High Level Managers, held in Paris 20 - 21 January 1994, created a North Atlantic Implementation Management Group (NAT IMG) to co-ordinate and manage - on behalf of the NAT SPG itself - the NAT Implementation Plan. This led the NAT SPG to review and revise its organization and working methods.

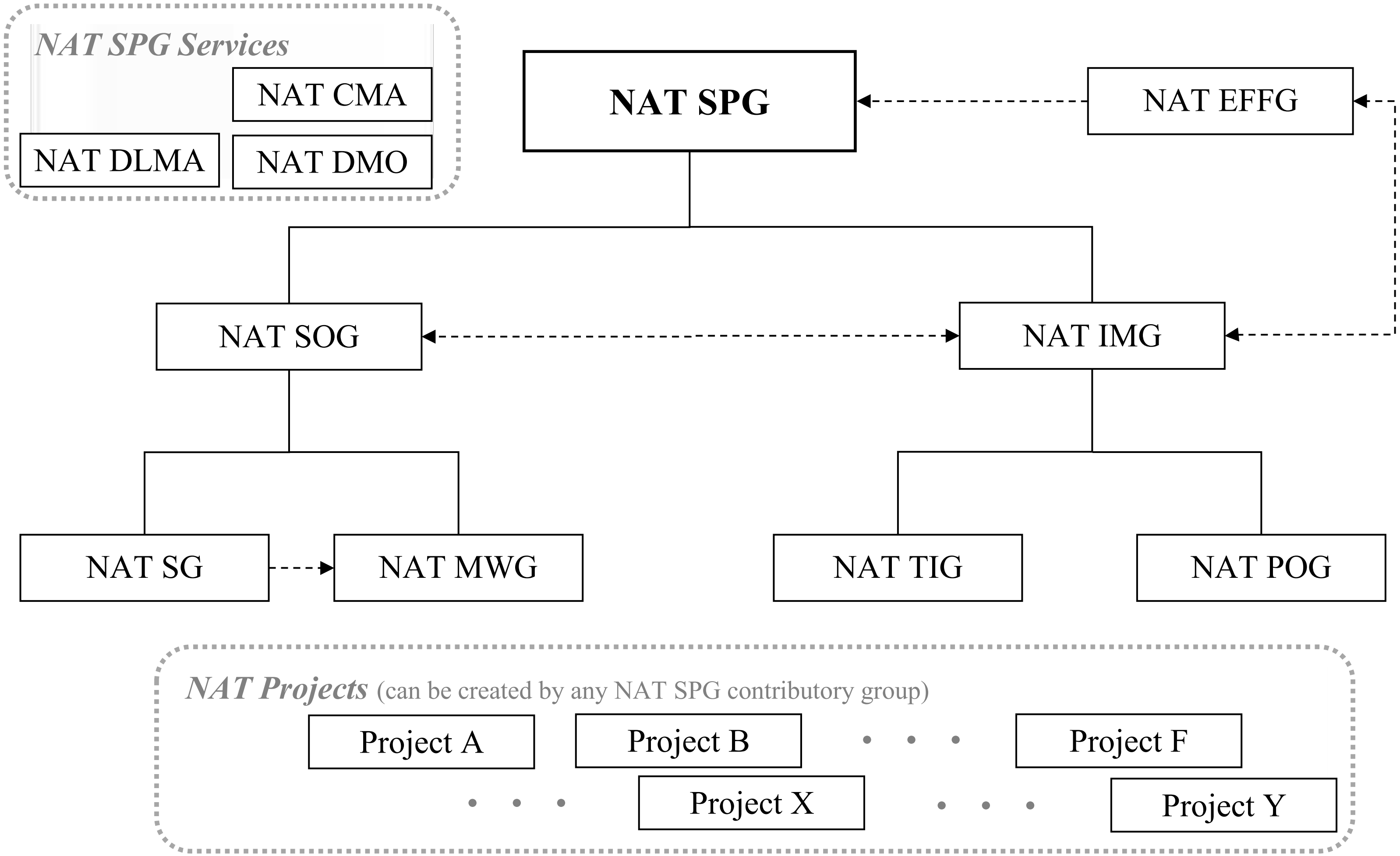
At NAT SPG/45, Paris, 23-26 June 2009, it was agreed to make adjustments to the NAT SPG working structure and to the terms of reference of its contributory bodies to accommodate the change in emphasis to performance based requirements, as driven by the Global ANP, and to take account of the Global Aviation Safety Plan (GASP). At the same time, the NAT SPG approved a high level safety policy which would be applicable to its work.

The purpose of the NAT SPG Handbook is to give an overview of the organization of the NAT SPG and its different groups, including terms of reference, working methods, participation, allocated Lines of Action from the NAT Implementation Plan and relevant Points of Contact. The handbook will be helpful to States and international organizations when planning and managing the resources for participation in the work.

The NAT SPG Handbook is published by the ICAO European and North Atlantic Office on behalf of the Chairman of the NAT SPG and distributed to all identified Points of Contact in the NAT SPG organization.

Asgeir PALSSON
Chairman of the NAT SPG

0:A — NAT SPG WORKING STRUCTURE



0:B — SAFETY POLICY STATEMENT

(As endorsed by NAT SPG/45 in June 2009, NAT SPG Conclusion 45/1 refers)

Safety is one of the NAT SPG's core business functions. The NAT SPG is committed to developing, implementing, maintaining and constantly improving strategies and processes to ensure that all our aviation activities take place under a balanced allocation of organizational resources. The NAT SPG will aim to achieve the highest level of safety performance and meet regional safety objectives in line with national and international standards, the Global Aviation Safety Plan (GASP) and the Global Air Navigation Plan.

OBJECTIVE

The objective of the NAT SPG member States is to maintain and, where possible, improve the agreed safety standards in all activities supporting the provision of air navigation services in the North Atlantic Region:

- All involved States are accountable for the delivery of the agreed level of safety performance in the provision of air navigation services in the North Atlantic Region.
- All involved States are accountable for the delivery of the agreed level of safety performance in aircraft operations in the North Atlantic Region.
- Safety in the NAT Region is managed through the organization and activities of the relevant implementation and oversight groups established by the NAT SPG, in coordination with the non-member States and observers, to achieve its Safety Objective.

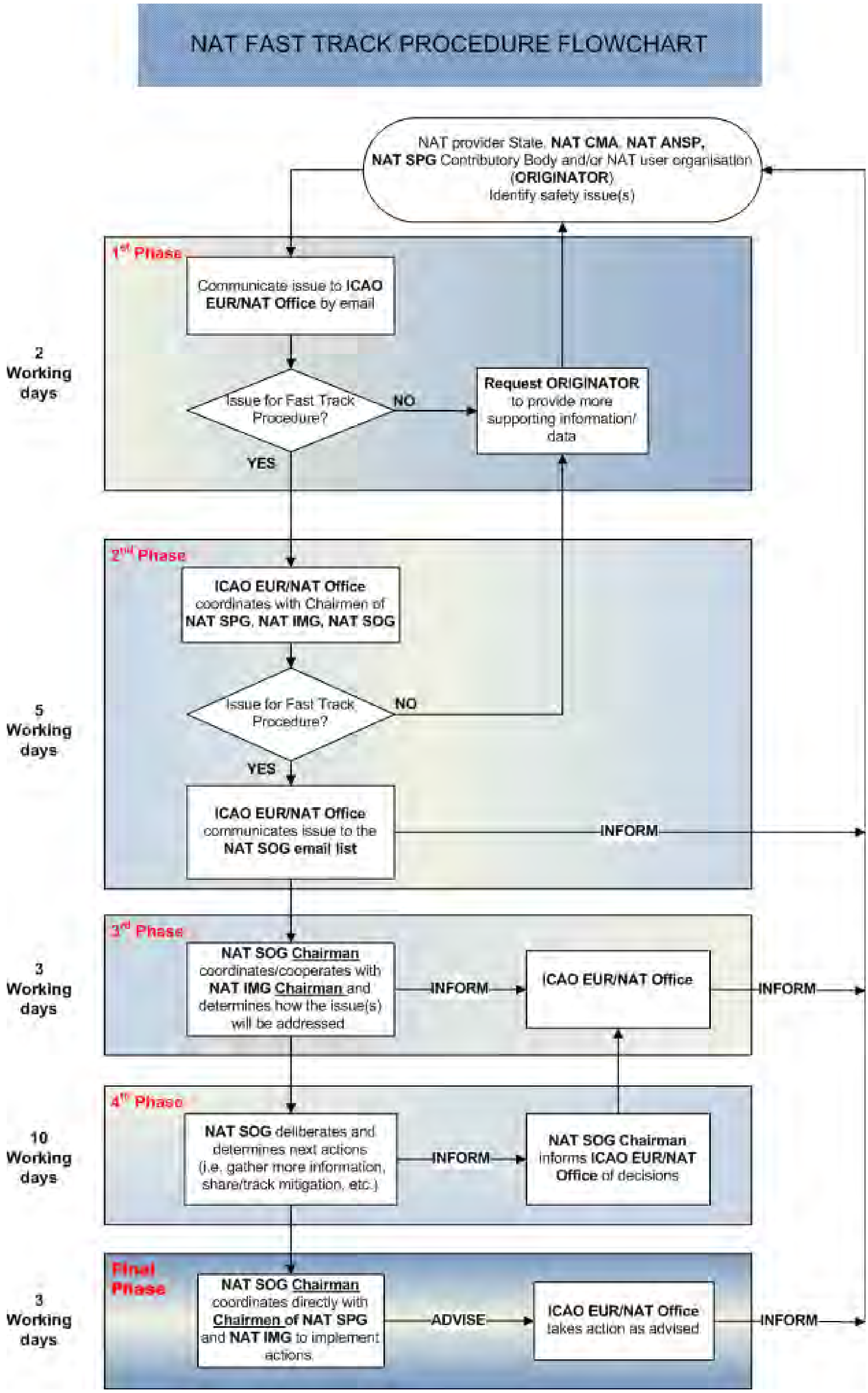
Guiding Principles

The NAT SPG will act to:

- **Clearly define** all accountabilities and responsibilities for the delivery of safety performance with respect to the provision of air navigation services and participation in the NAT SPG and its contributory bodies;
- **Support** the safety management activities that will result in an organizational culture that fosters safe practices, encourages effective safety reporting and communication, and actively manages safety within the NAT Region;
- **Share** safety related data, knowledge and expertise with concerned stakeholders;
- **Disseminate** safety information and NAT operating requirements to stakeholders;
- **Establish and implement** hazard identification and risk management processes in order to eliminate or mitigate the safety risks associated with air navigation services supporting aircraft operations in the North Atlantic Region;
- **Establish and measure** NAT Region safety performance against agreed safety standards; and
- **Continually improve** our safety performance through safety management processes

0:C — NAT FAST TRACK PROCEDURE FOR SAFETY OCCURRENCES

(As endorsed by NAT SPG/50 in June 2014, NAT SPG Conclusion 50/16 refers)



NAT FAST Track Procedure for Safety Occurrences Reporting Form

ORIGINATOR: (NAT Provider State, NAT CMA, NAT ANSP, NAT SPG Contributory Body and/or NAT user organisation)	*[Indicate here who is at the origin of the NAT Fast Track Procedure (NFTP) request]*
Contact Point: name, email, phone number	*[Provide here contact details on who to ask for further information on the safety issue that triggered this NFTP request, and who to report to on the progress of this NFTP request]*
Domain(s) affected	*[Indicate here the operational domains/activities affected by the safety issue that triggered this NFTP request, for example: flight plan processing, phraseology etc.]*
Geographical area affected	*[Indicate here the geographical area affected by the issue]*
Description of the case	*[Describe here the safety issue that triggered this NFTP request, in full detail, including: extensive description of the safety issue and its effect, an assessment on why this is a safety issue (*e.g. *what is the impact on safety). This is basically the rationale for this NFTP]*
Supporting data	*[Provide here, or in an attachment, all data/elements collected to support the case described above, (domain(s),geographical area, description, safety impact) covering all aspects listed in this form]*
Evaluated safety impact	*[Provide here, in an explicit, and if possible, in a detailed and comprehensive manner, an evaluation of the safety impact of the issue that triggered this NTFP]*
Proposed solution(s) or corrective/mitigation action(s)	*[Provide here one or several solution(s) or corrective/mitigation action(s)]*

1 — NORTH ATLANTIC SYSTEMS PLANNING GROUP

(NAT SPG)

(Revised to reflect C-WP/13135, C 183/9 on 18 March 2008 and PRES RK/1560 dated 30 June 2008)

1. Terms of Reference (ToR)

The NAT SPG was established by the approval of the ICAO Council on 15 April 1965 (54/20) of Recommendation 4/1 - reproduced below - of the special North Atlantic Meeting, Montreal, 23 February - 20 March 1965, which specified within its sub-paragraphs the composition, terms of reference and method of operation of the Group.

Recommendation 4/1: North Atlantic Systems Planning Group

That, in order to ensure continuity in systems planning in the North Atlantic Region between successive North Atlantic Regional Meetings:

a) The governments of Canada, Ireland, France, the Netherlands, the United Kingdom and the United States be invited to designate suitably qualified experts to participate on their behalf in the work of a North Atlantic Systems Planning Group with the following terms of reference:

"To continuously study, monitor and evaluate the system in the light of changing traffic characteristics, technological advances and updated traffic forecasts, to the end that the North Atlantic Regional Plan may be adjusted on a timely, evolutionary basis. Throughout this work the group shall give close attention to the effectiveness of any suggested changes in relation to their costs."

b) Proposals by States for amendment of the North Atlantic Regional Plan that may be developed as a result of studies undertaken by the Group, be submitted for consideration by other North Atlantic States, either at ICAO North Atlantic Regional Meetings convened for the purpose, or by correspondence in accordance with established procedures.

c) The Group work with the flexibility and informality required to reduce to a minimum the administrative burden imposed on States and on ICAO.

d) The Group may invite, as and when it considers necessary or desirable, the co-operation and participation of other States and of public or private international organizations.

e) The Group meet approximately once a year and at least once every eighteen months either at the ICAO Paris Office, the ICAO Headquarters or elsewhere at the invitation of a State and pursue its work by correspondence between successive meetings.

f) All States of the North Atlantic Region be kept informed of the progress of work in the Group and be encouraged, as well as the international organizations concerned, to submit suggestions to assist the Group in its task.

2. Members

All ICAO Contracting States, who are service providers in an air navigation region and part of that region's ANP, should be included in the membership of that region's PIRG. Furthermore, user States are entitled to participate in any other PIRG meetings as a non-member.

Representatives of Canada, Denmark, France, Iceland, Ireland, Norway, Portugal, the United Kingdom and the United States are Members of the NAT SPG.

3. Observers

International organizations recognized by the Council may be invited as necessary to attend PIRG meetings as observers.

Representatives from the Russian Federation, ~~and~~ Spain and Trinidad and Tobago as well as Observers from EUROCONTROL, IAOPA, IATA, IBAC, IFAIMA, IFALDA, IFALPA, IFATCA, Iridium and Inmarsat are invited to participate in the work of the NAT SPG.

Requests from any other ICAO Contracting State or an international organization to attend the NAT SPG meetings will be reviewed on a case-by-case basis and decided by the NAT SPG Chairman. Such requests must be supported by the appropriate rationale to attend the meeting[1].

4. Chairman

The Chairmanship of the NAT SPG will be reviewed by an election every four years[1].

5. Vice-Chairman

In accordance with NAT SPG Conclusion 49/27, the NAT IMG and NAT SOG Chairmen will serve as NAT SPG Vice-Chairmen[1].

6. Secretary

The ICAO Regional Director, European and North Atlantic Office, serves as the Secretary of the NAT SPG.

7. Meeting Documentation

The following documentation, including proposed action as required, may be presented by States, International Organizations or the Secretariat:

- Working Papers normally contain material with a draft decision, conclusion or inviting action by the meeting. Working papers are submitted at least 2 weeks prior to the meeting,
- Information Papers are submitted in order to provide the meeting with information on which no action is required and will not necessarily be discussed at the meeting. Information papers are submitted at least 1 week prior to the meeting.
- Flimsies are documentation prepared on an ad hoc basis in the course of a meeting, normally in support of an existing working paper, and with the purpose to assist the meeting in the discussion on a specific matter or in the drafting of a text for a Conclusion or Decision.

[1] *NAT SPG Conclusion 49/27 refers*

8. Conduct of the meetings of the NAT SPG groups and sub-groups[1]

Rapporteur – The Rapporteur facilitates the work of the meeting so as to encourage consensus or clearly identify barriers to consensus. The tasks of the Rapporteur include ensuring the efficient conduct of the meeting, ensuring that the tasks associated with the work programme are addressed or reported upon during the course of the meeting and reporting the findings of the meeting to the group(s) specified in the terms of reference. In the NAT SPG working structure, contributory groups to the NAT IMG and NAT SOG operate with Rapporteurs.

Chairman – In addition to the duties of a Rapporteur, the Chairman may make decisions regarding the conduct of the meeting and, in cases where it is not possible to reach consensus, determine the recommendation(s) that will be made by the meeting. In the NAT SPG working structure, the NAT SPG, NAT IMG, NAT SOG and NAT EFFG operate with a Chairman.

Vice-Chairman – The vice-Chairmen will be called upon to preside over the meeting should circumstances prevent the Chairmen from being present at the meeting. The vice-Chairmen may also be requested to support the Chairmen in his/her role, taking over some of the Chairmen's work load whenever appropriate. The vice-Chairmen do not automatically succeed as chairmen at the conclusion of the term of the incumbent Chairman. In the NAT SPG working structure, the NAT SPG, NAT IMG and NAT SOG operate with a vice-Chairman. The NAT IMG and NAT SOG Chairmen will serve as NAT SPG vice-Chairmen[2].

9. Election of Chairmen/vice-Chairmen/Rapporteurs of the NAT SPG and its Contributory Groups[3]

Review of chairmanship will be conducted by a routine process of elections for the NAT SPG, NAT EFFG, NAT IMG, and NAT SOG every four years. In the event that a Chairman is unable to complete a term, another election would be held.

Review of vice chairmanship will be conducted by a routine process of elections for the NAT IMG and NAT SOG every four years, normally at the same time as the routine elections of the NAT IMG and NAT SOG Chairmen.

Review of rapporteurship will be conducted by a routine process of elections for the Contributory Groups of the NAT IMG and NAT SOG every four years. Efforts will be made to avoid changes in rapporteurship for multiple groups during the same year.

Chairman – Nominations and Election for the NAT SPG

1. Candidates for election to the post of Chairman must be from a NAT SPG member State and nominated by a member State of the NAT SPG and seconded by another member State of the NAT SPG.

2. Nominations should be submitted to the EUR/NAT Office of ICAO and be promulgated by the EUR/NAT Office of ICAO to the NAT SPG member States by e-mail two months before the next meeting of the NAT SPG.

3. The NAT SPG will elect the Chairman from the list of candidates by open vote at the NAT SPG meeting and the newly elected Chairman will assume his functions at the conclusion of the meeting.

[1] *NAT SPG Conclusion 45/3 refers*
[2] *NAT SPG Conclusion 49/27 refers*
[3] *NAT SPG Conclusion 49/27 refers*

Chairman – Nominations and Election for the NAT EFFG, NAT IMG, and NAT SOG

1. Candidates for election to the post of Chairman must be from a NAT SPG member State and nominated by a member State of the Group concerned and seconded by another member State of the Group.

2. Nominations should be submitted to the EUR/NAT Office of ICAO and be promulgated by the EUR/NAT Office of ICAO to the NAT SPG member States by e-mail two months before the next meeting of the Group concerned.

3. The Group will elect the Chairman from the list of candidates by open vote at its eeting.

4. The NAT SPG will confirm the election of the Chairman at its meeting and agree that the newly elected Chairman will assume his functions as Chairman at the next meeting of the Contributory Group concerned.

Note: the election of vice-Chairmen of the NAT IMG and NAT SOG will be conducted informally by open vote at the meeting of the Group concerned following the election of the Chairman.

Rapporteur – Nominations and appointment of the NAT IMG and NAT SOG Contributory Groups (NAT MWG, NAT POG, NAT SG, and NAT TIG)

1. Candidates for election to the post of Rapporteur must be from a NAT SPG member State and nominated by a member State of the Group concerned and seconded by another member State of the Group.

2. Nominations should be submitted to the EUR/NAT Office of ICAO and be promulgated by the EUR/NAT Office of ICAO to the NAT SPG member States by e-mail two months before the next meeting of the Group concerned.

3. The Group will elect the Rapporteur from the list of candidates by open vote at its meeting.

4. The parent Group concerned will confirm the election of the Rapporteur and agree that the newly elected Rapporteur will assume his functions at the next meeting of the Contributory Group concerned.

Note: Parent Groups of the Contributory Groups:
NAT IMG – NAT POG, NAT TIG
NAT SOG – NAT SG, NAT MWG

10. Procedure for processing of Proposals for Amendment to the NAT SUPPs

10.1. Proposals for amendment (PfA) to the NAT *Regional Supplementary Procedures* (SUPPs, Doc 7030) should be reviewed and endorsed by the NAT SPG before further processing by the ICAO Secretariat.

10.2. The ICAO Secretariat will process the PfA in accordance with the formal procedures immediately after its endorsement by the NAT SPG.

10.3. In exceptional cases, if a PfA requires urgent processing between two NAT SPG meetings, the ICAO Secretariat will circulate the PfA to the NAT SPG member States and Observers by correspondence for approval.

11. Formulation of recommendations to the NAT SPG[1]

11.1. The NAT SPG contributory groups are to provide reports that are as concise as possible, whilst providing sufficient detail and supporting material for any recommendations which might be made. In

[1] *NAT SPG Conclusion 48/12 refers*

order to clarify the intent of contributory group recommendations they are to be formulated in the form of "draft NAT SPG Conclusions". Each draft Conclusion is to be accompanied by sufficient supporting justification, which is to include, at minimum:

a) a concise summary of the discussion of the group, including the reasons why particular options are or are not supported;

b) the full text of any material proposed for adoption by the NAT SPG into a NAT SPG or ICAO document;

c) the full text of proposed revisions to text of an existing NAT SPG or ICAO document, with insertions shown in grey highlight (text to be inserted) and deletions shown in strikethrough (~~text to be deleted~~); and

d) a clear description of why the NAT SPG should endorse the draft Conclusion, what is expected in order to fully address the conclusion, who should carry out the actions required and when the actions should be completed, using the tabular format described below.

11.2. The following Table 1 shall be used to summarize why the NAT SPG should endorse the draft Conclusion , what is expected to fully address the conclusion, who should carry out the actions required and when the actions should be completed:

Table 1:

Why	
What	
Who	
When	

11.3. Draft NAT SPG Conclusions shall be presented in the following format:

Draft NAT SPG Conclusion ##/NATXXXYY/Z – TITLE

That the NAT(Group designation)/ICAO Regional Director, Europe and North Atlantic:

a) AA;

b) BB; and

c) CC.

Where:

TITLE is a concise description of the subject addressed by the proposed draft Conclusion.
For a PfA to the SUPPs, this title shall start with “PfA to the SUPPs,”;

is the designation of the next NAT SPG meeting;

NATXXXYY is the designation and meeting number of the NAT SPG contributory group proposing the draft Conclusion; and

Z is a number indicating the sequence of the proposed draft Conclusion as it appears in the contributory group report.

11.4. When formulating each (draft) NAT SPG Conclusion, all acronyms except NAT SPG shall be decoded when they are initially used. This shall be true even for acronyms which have appeared in a previous draft Conclusion. It is acceptable to use an acronym in the title, so long as it is decoded in the body of the draft Conclusion.

12. Projects and Project Teams for the NAT SPG Working Structure

12.1. The general guiding principles to govern the establishment and the work of projects and projects teams are as follows:

a) A Project is defined as a specific activity that is finished over an agreed period of time and intended to achieve a specific outcome of the agreed SPG work programme;

b) The period of a Project is normally not greater than 6 months;

c) The NAT SPG contributory groups are responsible for the identification of the Projects that will deliver the work programme in the most efficient and effective way considering, for example, expert resource availability, dependencies of outcomes from other activities, meeting efficiency;

d) A Project Team consists of individuals/experts assembled to perform activities that contribute towards achieving the tasks related to the Project. For each Project Team a Project Lead shall be identified, responsible for the leadership of the team to deliver the required outcomes within the agreed timescales, and to report to the parent group. For practical reasons the appointed project lead should be a member of the project supervisory body; and

e) All NAT SPG contributory groups shall establish and maintain a Project Definition document for all projects that are under their ownership for the purpose of project initiation, supervision and closure. The following elements (Table 2 refers) shall be considered as a minimum in a Project.

Table 2: Project Definition Contents

Project Title	Unique and concise project title that relates to the outcomes of the project
Parent Group	The parent body that approves the project
Project Supervisory body	The SPG contributory body that supervises the project, e.g. IMG, POG, TIG, SOG, etc.
Project Period	Forecast period for which the project will be active (specific timeframe to be used: e.g. dates, time of a specific meeting etc).
Project Objective	What is the purpose of the project and how does it relate to the delivery of the NAT strategy and Roadmap
Project Outcomes:	What will be physically delivered by the project
Membership	Who are the project team members
Coordination Requirements	Which other bodies will the project need to coordinate with to achieve the outcomes
Project High level Tasks	At a summary level what are the key tasks that this project will perform to achieve the outcomes
Project Lead	Who, from the project supervisory body, will be responsible for the leadership of the project to achieve the outcomes, and for reporting to the parent group.
Project Secretariat Support	Who will be the support from the ICAO Secretariat

12.2. The general guiding principles to help the establishment and the governance of projects and projects teams are as follows:

a) The NAT SPG contributory groups shall identify projects that are required to deliver those aspects of the NAT SPG Work Programme that the parent group have agreed as being their responsibility;

b) The NAT SPG contributory groups shall form Project Teams as required to deliver the projects in the most efficient and effective manner. Project Teams are not required to have the parent group endorsement, unless they envisage physical meetings outside the NAT SPG contributory group regular meeting; when establishing a Project Team its work programme shall be established in the most efficient and effective way considering, for example, expert resource availability, dependencies of outcomes from other activities and meeting efficiency; it is expected that the Project Teams work mainly by correspondence.

c) The NAT SPG contributory groups are required to provide regular updates to their parent group meeting on the following:

   i. Summary on the progress of "active" projects, including justification of those projects with a life time greater than 6 months or the need for physical meetings outside the NAT SPG contributory group regular meetings;

   ii. Summary of those projects that have been completed; and

   iii. Proposal of projects required to deliver the next period of the NAT SPG Work Programme, including justification of those projects with a life time greater than 6 months, for endorsement by the parent group.

d) The NAT SPG contributory group *Rapporteurs*, or their delegate, should provide a report of their groups to the parent group by attending, as a minimum, the respective meeting agenda item by the most efficient and convenient means, i.e. in person, telephone conference, etc. coordinated with the Secretariat.

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13. NAT SPG REPRESENTATIVES

(Kept up-to-date by the Secretariat upon reception of nomination to the NAT SPG)

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1:A — NAT ECONOMIC, FINANCIAL AND FORECAST GROUP

(NAT EFFG)

Terms of Reference

The NAT EFFG is responsible to the NAT SPG for providing economic, financial and traffic forecasting advice to the NAT SPG in order to ensure the cost-effective management of the aviation system within the ICAO NAT Region and will:

1. Provide the NAT SPG with appropriate financial management expertise and advice in the areas of, inter alia, cost identification, cost allocation models, performance and productivity indicators, variance analyses and standardised financial reporting.
2. Provide advice to the NAT SPG as to best practice in the area of cost recovery and charging for the provision of air navigation services.
3. Develop proposals addressing financial and their related organisational aspects for implementing multinational facilities and services employed by provider States in the ICAO NAT region.
4. In coordination with the NAT IMG, develop and/or assess business-case analysis of planned implementations proposed under the NAT SPG work programme.
5. Provide NAT traffic forecasts.
6. Address other issues as directed by the NAT SPG.
7. Report to the NAT SPG.

Composition

The NAT EFFG is composed of Members from Canada, Denmark, Iceland, Ireland, Norway, Portugal, the United Kingdom and the United States, IATA and IBAC and with the participation of France as an observer.

The NAT EFFG may invite other participants as and when required in order to ensure that the relevant expertise is available when addressing specific tasks or issues.

The Chairmanship of the NAT EFFG will be reviewed by an election every four years and confirmed by the NAT SPG[1].

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[1] *NAT SPG Conclusion 49/27 refers.*

2 — TERMS OF REFERENCE FOR THE NAT IMG AND ITS CONTRIBUTORY GROUPS

2:A — NAT IMPLEMENTATION MANAGEMENT GROUP

(NAT IMG)

Terms of Reference

The NAT IMG is responsible to the NAT SPG for the identification, development and coordinated implementation of safe and efficient programmes supporting the aviation system within the ICAO NAT Region, and will:

1. In line with the *Global Air Navigation Plan* (GANP), *Global Aviation Safety Plan* (GASP) and Aviation System Block Upgrades (ASBU), including recommending implementation priorities and updating timetables and associated milestones for NAT SPG approval.
2. Identify, detail and recommend allocation of tasks and resources required to fulfil coordinated implementation of safety and efficiency improvements affecting operations in the ICAO NAT Region and as appropriate, approve or amend the terms of reference of NAT IMG contributory bodies and to direct their work programmes.
3. In coordination with the NAT Economic, Financial and Forecast Group (NAT EFFG), develop and/or assess business-case analysis of planned implementations proposed under the NAT SPG work programme.
4. In coordination with NAT Safety Oversight Group (NAT SOG), assess the safety performance of the aviation system within the ICAO NAT Region.
5. Ensure the necessary co-ordination and/or consultation with NAT Provider States, other States, NAT Users and appropriate international organizations.
6. Propose amendments to the *North Atlantic Air Navigation Plan*, the *North Atlantic Regional Supplementary Procedures* (Doc 7030), and all other relevant NAT-developed documents as directed by the NAT SPG.
7. Address other issues as directed by the NAT SPG.
8. Provide reports and recommendations concerning the above tasks to the NAT SPG.

Composition

The NAT IMG is composed of representatives of the NAT SPG member States. In order to ensure that NAT users' views are represented and to provide valuable operational experience, NAT IMG meetings are also attended by representatives from IATA, IBAC, IFALPA and IFATCA.

The NAT IMG might invite other participants as and when required in order to ensure that the relevant expertise is available when addressing specific tasks. The Rapporteurs of the new Contributory Bodies may also be invited to attend as per agenda items.

The Chairmanship and vice-Chairmanship of the NAT IMG will be reviewed by an election every four years and confirmed by the NAT SPG[1].

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[1] *NAT SPG Conclusion 49/27 refers.*

2:B — THE NAT IMG CONTRIBUTORY GROUPS

1. General principles applicable to the NAT IMG working structure

The principles listed below apply to all NAT IMG contributory bodies. They should to the extent possible be applied to task forces that the NAT IMG may set up from time to time as well as to the sub groups that the contributory bodies may establish.

2. Safety management statement

All NAT IMG contributory bodies shall support the objective of, and abide by the guiding principles of, the NAT SPG Safety Policy whilst carrying out their activities. In order to facilitate the exchange of safety management information, all reports of NAT IMG contributory groups shall clearly identify safety management related issues.

3. Working methods

The NAT IMG working groups will meet face-to-face at least once a year and at other times as required by the work programme. Yearly meeting dates and the requirement for additional face-to-face meetings will be as approved by the NAT IMG.

The working groups will make every reasonable effort to use other means such as teleconference and electronic correspondence to reduce the frequency of face-to-face meetings. Work will be carried out as required using such other means between face-to-face meetings in order to expeditiously carry their business.

4. Rapporteurship

The Rapporteur of each NAT IMG working group will be nominated from amongst the NAT SPG member States by the NAT IMG. The rapporteurship of each group will be reviewed at least once every two years. Keeping in mind the need to support continuity, changes will be made only when necessary and efforts will be made to avoid changing multiple Rapporteurs in the same year.

5. Formulation of recommendations to the NAT IMG

5.1. Recommendations to the NAT IMG are to be formulated as draft NAT IMG Decisions.

5.2. If NAT SPG action will be required, the NAT IMG will take the necessary action to draft a proposed NAT SPG Conclusion as appropriate.

5.3. The guidance for drafting of NAT SPG Conclusions in Section 1 shall also apply for NAT IMG Decisions.

2:C — NAT PROCEDURES AND OPERATIONS GROUP

(NAT POG)

Terms of Reference

The Procedures and Operations Group develops proposals for new and amended procedures supporting air navigation services provision and aircraft operations in the ICAO NAT Region. This function is carried out under the direction, and to support the work programme, of the NAT IMG. The following on-going tasks are required to carry out this function:

1. Developing proposed procedures and guidance material to respond to planned technological changes and CNS/ATM implementations affecting operations in the ICAO NAT Region.
2. Developing proposed amendments so as to maintain the currency of the procedures and guidance detailed in: *ICAO Regional Supplementary Procedures - North Atlantic Region* (NAT SUPPs, Doc 7030), NAT Operations Bulletins and documents promulgated by the NAT SPG.
3. Developing proposals to respond to identified deficiencies in the safety or efficiency of NAT operations.
4. Commenting on the procedural and operational aspects of safety management material presented to support proposed changes affecting operations in the ICAO NAT Region.
5. Providing reports on, and recommendations arising from, the above tasks to the NAT IMG.
6. Addressing other tasks as directed by the NAT IMG.

Composition

Experts to address the foregoing tasks may be nominated by: NAT SPG member States, Spain, EUROCONTROL, IATA, IBAC, IFALDA and IFALPA.

Working methods

The group will meet face-to-face at least once a year and at other times as required by the work programme. Yearly meeting dates and the requirement for additional face-to-face meetings will be as approved by the NAT IMG.

The group will make every reasonable effort to use other means such as teleconference and electronic correspondence to reduce the frequency of face-to-face meetings. Work will be carried out as required using such other means between face-to-face meetings in order to expeditiously carry their business.

The Rapporteur of this group will be reviewed every four years by election and confirmed by the NAT IMG[1].

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[1] *NAT SPG Conclusion 49/27 refers*

2:D — NAT TECHNOLOGY AND INTEROPERABILITY GROUP

(NAT TIG)

Terms of Reference

The Technology and Interoperability Group develops proposals to harmonise implementation and increase interoperability between systems supporting air navigation services provision and aircraft operations in the ICAO NAT Region. This function is carried out under the direction, and to support the work programme, of the NAT IMG. The following on-going tasks are required to carry out this function:

1. Developing proposed guidelines for harmonised implementation and interoperability to respond to planned technological changes and CNS/ATM implementations affecting operations in the ICAO NAT Region.
2. Developing proposed amendments so as to maintain the currency of the technical information detailed in: *ICAO Regional Supplementary Procedures - North Atlantic Region* (NAT SUPPs, Doc 7030), NAT Operations Bulletins and documents promulgated by the NAT SPG.
3. Developing proposed mechanisms for monitoring and reporting on the technical performance of CNS/ATM systems and automation supporting operations in the ICAO NAT Region.
4. Developing proposals to respond to identified deficiencies in the safety, efficiency or interoperability of CNS/ATM systems or automation supporting NAT operations.
5. Commenting on the technological aspects of safety management material presented to support proposed changes affecting operations in the ICAO NAT Region.
6. Providing reports on, and recommendations arising from, the above tasks to the NAT IMG.
7. Addressing other tasks as directed by the NAT IMG.

Composition

Experts to address the foregoing tasks may be nominated by: NAT SPG member States, ARINC~~rinc~~, EUROCONTROL, IATA, IBAC, IFALDA, ~~and~~ IFALPA, Inmarsat, Iridium and Sitaonair.

Working methods

The group will meet face-to-face at least once a year and at other times as required by the work programme. Yearly meeting dates and the requirement for additional face-to-face meetings will be as approved by the NAT IMG.

The group will make every reasonable effort to use other means such as teleconference and electronic correspondence to reduce the frequency of face-to-face meetings. Work will be carried out as required using such other means between face-to-face meetings in order to expeditiously carry their business.

The Rapporteur of this group will be reviewed every four years by election and confirmed by the NAT IMG[1].

[1] *NAT SPG Conclusion 49/27 refers*

3 — TERMS OF REFERENCE FOR THE NAT SOG AND ITS CONTRIBUTORY GROUPS

3:A — NAT SAFETY OVERSIGHT GROUP

(NAT SOG)

Terms of Reference

The NAT SOG is responsible to the NAT SPG for safety oversight in the NAT Region, and will:

1. Review system safety performance in the NAT Region.
2. Share data on safety-related occurrences in the NAT Region.
3. Support the development of best practices in the management of safety in the NAT Region.
4. Keep under review and, when appropriate, propose revisions to the safety Key Performance Indicators (KPI) established for the ICAO NAT Region.
5. Ensure safety-related occurrences in the NAT Region are analysed by the appropriate NAT SOG contributory groups to determine root causes.
6. Identify areas where mitigation is required and report to the NAT SPG and coordinate with NAT IMG. Assess the effectiveness of implemented mitigation measures.
7. Keep under review safety monitoring methods and analysis and recommend improvements to the process as appropriate.
8. Monitor safety cases in progress and review completed safety cases prepared to support changes to the NAT air navigation system.
9. Collect data on and monitor safety KPIs.
10. ~~Advise the NAT SPG annually on the performance of the ICAO NAT Region in relation to the safety KPIs~~. Develop and present to the NAT SPG for approval the NAT Annual Safety Report in which the safety performance for the ICAO NAT Region, as well as the safety priorities and targets, consistent with the Global Aviation Safety Plan and the NAT Safety Policy, are consolidated.
11. Address other safety-related issues as necessary.
12. Use the fast track to advance safety concerns between formal meetings.
13. Report to the NAT SPG.

Composition

The NAT SOG is composed of representatives from the NAT SPG member States. State representatives should be in a position to address service delivery and flight operations regulatory issues in the NAT Region, and as necessary regulatory issues related to the conduct of flight operations in the NAT Region. In order to ensure that NAT users' views are represented and to provide valuable operational experience, NAT SOG meetings are also attended by representatives from Spain, IATA, IBAC, IFALPA and IFATCA. The NAT SOG may invite participants from other States or organisations as required.

The Chairmanship and vice-Chairmanship of the NAT SOG will be reviewed by an election every four years and confirmed by the NAT SPG[1].

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[1] *NAT SPG Conclusion 49/27 refers*

3:B — THE NAT SOG CONTRIBUTORY GROUPS

1. Formulation of recommendations to the NAT SOG

1.1. Recommendations to the NAT SOG are to be formulated as draft NAT SOG Decisions.

1.2. If NAT SPG action will be required, the NAT SOG will take the necessary action to draft a proposed NAT SPG Conclusion as appropriate.

1.3. The guidance for drafting of NAT SPG Conclusions in Section 1 shall also apply in formulation of NAT SOG Decisions.

3:C — NAT MATHEMATICIANS' WORKING GROUP

(NAT MWG)

Terms of Reference

The NAT MWG reports to the NAT SOG and is responsible for providing mathematical and statistical advice relating to the on-going monitoring of safety through the assessment of collision risk and any other tasks as determined by the NAT SOG. It has the following terms of reference:

1. Estimate annually the lateral and vertical occupancies (traffic densities) in the NAT Region.
2. Estimate the current lateral and vertical collision risks to show whether the estimated risks meet the respective target levels of safety.
3. Identify trends that may not be identified within the NAT SG Report including component elements of the collision risk model and highlight where safety improvements could prove most effective.
4. To reflect changes in operating conditions within the NAT region, review the collision risk model.
5. Periodically perform other data collections (e.g. core navigation studies) in order to ensure that the parameter values within the mathematical collision risk models remain current.
6. Review other mathematical aspects as directed by the NAT SOG and/or the NAT SPG.
7. Coordinate with the NAT SG.
8. Report to the NAT SOG.

Composition

The NAT MWG is composed of experts from the NAT SPG member States, Spain, IATA and IFALPA. Representatives from EUROCONTROL may also be invited as observers in order to ensure consistency between related European and North Atlantic work programmes.

The Rapporteur of the NAT MWG will be chosen by the State having the risk calculation responsibility. The term limit for the MWG Rapporteur will be one calendar year from 1 July to 30 June.

Working Methods

The NAT MWG conducts its work in accordance to the NAT MWG Handbook and via correspondence to the extent possible.

3:D — NAT SCRUTINY GROUP

(NAT SG)

Terms of Reference

The NAT SG is responsible to the NAT SOG for ensuring the correct categorization of NAT Region reported occurrences for the purposes of mathematical analysis and other safety management activities. To that end, the NAT SG will:

1. For the purpose of mathematical analysis, and in close cooperation with the NAT MWG, categorise navigational errors and altitude deviations of 300ft or more occurring in NAT HLA (NAT High Level Airspace) airspace.

2. For the purpose of safety management activities, categorize reported occurrences in the NAT Region as directed by the NAT SOG.

3. Analyse occurrences in order to allow the study of trends and prevalent causes.

4. Evaluate the effect of, and provide advice and recommendations to the NAT SOG on the implemented mitigations in the NAT region.

5. Work in close co-operation with the NAT CMA to compile data necessary to conduct safety analysis in the NAT Region.

6. Keep under review the procedures for collecting and categorising occurrence reports.

7. Address other related issues as directed by the NAT SOG.

8. Report at least twice per year to the NAT SOG; the reports should include findings from all tasks of the SG (vis-à-vis ToRs). Ensure that reports are sent to the SOG at least 2 weeks prior to SOG's biannual meetings.

9. Report once per year on the categorisation of occurrences for mathematical analysis to the NAT MWG.

Composition

The NAT SG is composed of nominated experts from the NAT SPG member States, Spain, NAT MWG, NAT CMA, IATA, IBAC, IFALDA, IFALPA and IFATCA.

The Rapporteur of the NAT SG will be reviewed by an election every four years and confirmed by the NAT SOG[1].

Working Methods

The NAT SG conducts its work in accordance to the NAT SG Handbook and via correspondence to the extent possible.

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[1] *NAT SPG Conclusion 49/27 refers*

4 — TERMS OF REFERENCE FOR THE NAT SPG SERVICES

4:A — NAT CENTRAL MONITORING AGENCY

(NAT CMA)

Terms of Reference

The NAT CMA is responsible to the NAT SOG for certain aspects of operations monitoring and reporting in the NAT Region. Specifically, its principle functions are:

1. Monitor the level of risk as a consequence of operational errors and in-flight contingencies as follows:

   a) Establish and maintain a mechanism for collation and analysis of all operational errors, including vertical deviations of 90m (300ft) or more, ~~and~~ lateral deviations, and longitudinal losses of separations~~from the above errors/actions~~;

   b) Determine and analyse, wherever possible, the root cause of each deviation together with its magnitude and duration;

   c) Calculate the frequency of occurrences;

   d) Assess the overall risk (technical and operational) in the system against the overall safety objective (see Doc 9574 - *Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive*);

   e) Initiate follow-up action with State aviation authorities as required.

2. Circulate regular reports on all operational deviations, together with such graphs and tables necessary to relate the estimated system risk to the TLS, employing the criteria detailed in Doc 9574, for which formats are suggested in Appendix A to Doc 9574;

3. Produce a quarterly report on the operational performance in the NAT Region for distribution to the NAT SPG members and other interested parties, and submit an annual report to the PIRG (NAT SPG);

4. Act as the custodian of all aircraft technical height keeping performance data collected as part of the NAT Regional monitoring process.

5. Report height deviations of aircraft observed to be non-compliant, based on the following criteria:

   i. TVE ≥ 90m (300 ft);
   ii. ASE ≥ 75 m (245 ft);
   iii. AAD ≥ 90 m (300 ft);

   and take the necessary action with the relevant State and operator to determine:

   a) the likely cause of the height deviation;

   b) verify the approval status of the relevant operator;

   c) recommend, wherever possible, remedial action;

6. Analyse ASE data to detect height deviation trends and, hence, to take action as in the previous item;

   a) Investigate height-keeping performance of the aircraft in the core of the distribution:
      – the aircraft population
      – aircraft types or categories; and
      – individual airframes;

7. Provide NAT customers and State aviation authorities with height monitoring data on request;

8. Liaise with other Regional Monitoring Agencies (RMA) in order to achieve an exchange of monitoring and RVSM approvals data amongst the regions;

9. Contribute to the amendment and publication of the "NAT Minimum Monitoring Requirements" table in co-ordination with the Mathematicians Working Group and RMA Coordination Group;

10. Ensure that the requisite height monitoring is completed by operators of aircraft contained in the RVSM approvals database and to take appropriate action where necessary;

11. Establish and maintain a database of aircraft approved by the respective State authorities for operations within RVSM airspaces in that region;

12. Conduct checks of the approval status of aircraft operating in the relevant RVSM airspace, identify non-approved operators and aircraft using RVSM airspace and notify the appropriate State of Registry/State of the Operator accordingly.

13. Receive reports of non-compliance (*Performance-Based Communication and Surveillance (PBCS) Manual* (Doc 9869) refers) with RSP 180 and RCP 240 from NAT ANSPs and transmitting reports to the respective RMA associated with the State of the respective operator/aircraft;

14. Receive and maintain records of RCP and RSP approvals issued by States of Operator/Registry associated with current State responsibility and incorporating into expanded RVSM/PBCS approvals database and follow-up as appropriate instances of non-approved aircraft being identified in PBCS airspace. This would be determined by augmenting the existing monthly RVSM approvals check to incorporate a similar check against PBCS Approvals where these have been included in the flight plan but no approvals record is held by RMAs;

15. Share records of RCP and RSP approvals between RMAs in line with current sharing practices of RVSM approvals for the ability of States/ANSPs to verify that aircraft operators filing PBCS capabilities in the flight plan are authorized to do so. [1]

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[1] *Points 13 to 15, NAT SPG Conclusion 53/9 refers*

4:B — NAT DATA LINK MONITORING AGENCY

(NAT DLMA)

Terms of Reference

The NAT Data Link Monitoring Agency (DLMA) will report to the NAT TIG with respect to data link implementation, trials and operations.

It will receive and process routine and ad-hoc data and problem reports from end users and interested parties

The main tasks of the NAT DLMA are:

1. Problem analysis and resolution per D.3 of the GOLD, which includes:

    a) A means for reporting, e.g. a web-based service;

    b) Diagnose problems and recommend resolutions;

    c) Co-ordinate problem reports and resolutions with other regional data link monitoring agencies.

Note 1: In the context of the ToR, provisions of D.3 and D.4 of the GOLD are mandatory.

Note 2: The entity must enter into a confidentiality agreement with those stakeholders who require it to provide problem reports. Except as authorized by individual stakeholders, all problem reports and associated documentation shall be de-identified prior to distribution to members to protect the name and/or company originating the problem report. The entity must implement and maintain a program to protect confidential and sensitive information provided by NAT stakeholders. No identified data shall be kept longer than is essential to the successful resolution of the associated problem.

Note 3: D.3 and D.4 of the GOLD Edition 2.0 are integral parts of this ToR.

4:C — NAT DOCUMENT MANAGEMENT OFFICE

(NAT DMO)

Terms of Reference

The NAT DMO supports the ICAO EUR/NAT for ensuring the currency and consistency of the documentation relating to NAT operations with the following terms of reference:

1. Apprise the ICAO EUR/NAT Office in matters pertaining to the NAT Region of any need for changes to NAT documentation and seek approval for such work.

2. Under the ICAO EUR/NAT Office guidance and with expert contributions from the NAT contributory groups, ensure word editing and formatting of all ICAO NAT documents to timely incorporate the appropriately approved within the NAT working structure proposals for amendment to NAT documents.

Composition

The NAT DMO service will be provided by Iceland on behalf of the NAT SPG.

5 — NAT SPG POLICIES

Note: in the title of each policy "C ##/N" *stands for* "NAT SPG Conclusion ##/N"[1]

5:A — SAFETY RELATED POLICIES

[01] Establishment of a NAT Data Link Monitoring Agency (NAT DLMA) (C 45/17)

a) The United States established by 31 December 2009 a NAT DLMA; and

b) the NAT Implementation Management Group coordinates all safety related matters with the NAT Safety Oversight Group.

[02] Amendments to the list of safety key performance indicators for the ICAO NAT Region (C 48/18, C 49/02, C 51/11, C 53/15, C 55/19)

That the list of Key Performance Indicators (KPI) in the area of safety for the ICAO NAT HLA ~~Region~~ is as follows, with applicable targets:

Table 1 - Safety Key Performance Indicators and related targets

Key Performance Indicator		Target
i	Number of accidents	0
ii	Number of fatal accidents	0
iii	Number of fatalities related to aviation fatal accidents	0
iv	Rate of LHD events (No. of LHD events divided by No. of flight hours flown in the NAT region[2]), involving operations with Data Link in use	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~
v	Rate of LHD events (No. of LHD events divided by No. of flight hours flown in the NAT region), involving operations with Data Link not in use	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~
vi	Percent of Long Duration[3] LHD events	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~
vii	Rate of minutes that aircraft, with Data Link in use, spent at the wrong flight level (Amount of minutes spent at the wrong flight level divided by total duration of flights in minutes)	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~
viii	Rate of minutes that aircraft, with Data Link not in use, spent at the wrong flight level (Amount of minutes spent at the wrong flight level divided by total duration of flights in minutes)	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~
ix	Rate of GNE events[4] (No. of GNE events divided by No. of flight hours flown in the NAT region) , involving operations with Data Link in use	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~

[1] *e.g. C 47/01 means NAT SPG Conclusion 47/01, the NAT SPG Conclusion endorsing the policy*
[2] *Before getting the actual figures flight hour estimates can be used for calculation*
[3] *Long Duration LHD event means an event which is unprotected by ATC for a period exceeding 20 minutes, based on a threshold established after review of historical data reported to the NAT CMA*
[4] *GNE is a deviation of 10 NM or greater*

Key Performance Indicator		Target
x	Rate of GNE events (No. of GNE events divided by No. of flight hours flown in the NAT region), involving operations with Data Link not is use	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~
xi	Rate of losses of separation (vertical) (No. of losses of separation events divided by No. of flight hours flown in the NAT region)	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~
xii	Rates of losses of separation (lateral) (No. of losses of separation events divided by No. of flight hours flown in the NAT region)	Reduction over previous rolling three-year period of performance ~~compared to 2015-2016-2017 baseline~~

Table 2 - Target Level Of Safety (TLS) for lateral and vertical domains to be performed and reported by NAT ~~CMA~~ MWG to NAT SOG and NAT SPG

NAT safety performance		Target
xiii	Performance in the vertical dimension	5×10^{-9} fapfh[1]
xiv	Performance in the lateral dimension	~~20~~ 5 $\times 10^{-9}$ fapfh

[03] Lateral deviation classifications (C 48/21)

a) The following definitions are used when classifying reports made to the NAT Central Monitoring Agency (NAT CMA):

i) a lateral deviation is any actual deviation from the cleared track other than those covered by the Strategic Lateral Offset Procedures (SLOP);

ii) a Gross Navigation Error (GNE) is a lateral deviation from a cleared track by 10 Nautical Miles (NM) or more;

iii) an ATC intervention is an event where the Air Traffic Controller (ATCO) caught and corrected a lateral deviation before it developed into a GNE; and

iv) an ATC prevention is an event where the ATCO intervention prevented a lateral deviation; and

b) the NAT CMA initiates GNE-related follow up actions in regard to GNEs of 25 NM or more.

[04] Definition and Components of Safety Cases in support of changes to the NAT air navigation systems requiring NAT SPG approval (C 53/16, C 55/19)

That the definition and components of a safety case in support of changes to the NAT air navigation system requiring NAT SPG approval are as follows:

~~a~~1) A regional safety case in support of changes to the NAT air navigation system documents safety arguments relating to a proposal for a change in a specific FIR or multiple FIRs affecting operations in more than one NAT FIR; it references evidence, and includes the assessment of safety risk associated with the proposed change and common to more than one FIR in the NAT, risk controls and/or mitigations, and a monitoring plan to ensure that the effectiveness of the risk controls and mitigations is verified. A change may relate to the introduction of new operational concepts, new or modified procedures, novel separation minima, or the introduction of new systems. A safety case may be prepared by NAT IMG and/or a designated sub-group or project team within the NAT IMG working structure, or by one or several NAT ANSPs, and is owned by the change advocate.

[1] *Fatal accidents per flight hour*

2~~b~~) Proposed safety case(s) prepared to support changes within the NAT Region requiring NAT SPG approval should be presented to the NAT SOG for review by or through the NAT IMG, and include the following components:

a~~i~~) Change advocate {the NAT IMG sub-group or ANSP(s) who propose the change(s)};

b~~ii~~) Description of and rationale for the proposed change(s);

c) Assurance that the proposed change will fit the NAT airspace system and all common aspects of the implementing FIRs have been addressed;

d~~iii~~) Regional safety assessment, including as a minimum:

i. ~~Summary of hazard~~ identification of hazards common to the NAT region (or the FIRs affected by the change),

ii. ~~, risk analysis methodology and conclusions, including~~ risk assessment,~~;~~

~~iv)~~ iii. p~~P~~roposed risk controls and/or mitigations applicable to the NAT region;

e~~v~~) Conclusion showing that the evidence and argument demonstrate the proposed change(s) increases neither the overall risk associated with the NAT, nor increases the risks associated with any component part of the NAT system beyond acceptable levels and/or established NAT safety performance targets;

f~~vi~~) Required ~~P~~post-implementation monitoring and reversion plans;

g~~vii~~) Index or bibliography referencing supporting evidence; and

h~~viii~~) ~~Statements that the~~ Identification of necessary State approvals and/or other State requirements necessary to accommodate the change and assurance that those will be in place prior to implementation.

Note: A template containing the full definitions and components of Safety Cases is in ***Appendix A****.*

3) The objective of a NAT SOG review of completed safety cases shall be to assess the validity of given safety arguments, confer that applicable regional hazards were systematically identified and associated safety risks addressed, and provide assurance to the NAT SPG that all the established components of a regional safety case were accomplished. For a NAT SOG review, the following should be taken into account:

a) the timely review of a completed safety case is dependent on information being provided in a timely manner to the NAT SOG;

b) the review should be conducted by a group of representatives affected by the change that have not been directly involved with the development of the safety case to ensure an objective assessment; and

c) the aim should be to monitor safety cases in progress and review completed safety cases at the biannual SOG meetings.

5:B — IMPLEMENTATION PLANNING POLICIES

[05] Definition of Target Level of Safety (TLS) in the NAT Region (C 27/22, C 33/06, C 47/04)

The TLS is defined for the Implementation of the Reduced VSM in the NAT Region as follows:

a) the TLS for collision risk in the vertical dimension due to all causes be 5.0 x 10^{-9} fatal accidents per flight hour and that the overall collision risk in the vertical plane be assessed against this TLS; and

b) the TLS would not be partitioned into separate components for the different types of risk. However, assessments of height-keeping performance would need to be conducted with reference to a safety constraint of 2.5 X 10^{-9}, as this is the value which has been used to derive the Minimum Aircraft System Performance Specification.

A TLS of 5.0 x 10^{-9} fatal accidents per flight hour is used for planning purposes in carrying out the work required to sustain reductions in longitudinal separation minima.

A TLS of $5x10^{-9}$ fatal accidents per flight hour is used for planning purposes in carrying out the work required to sustain reductions in lateral separation minima in the ICAO NAT Region.

[06] ADS-B Eligibility List for the ICAO NAT Region (C 47/06)

Canada shall maintain an eligibility list on behalf of the ICAO NAT Region detailing aircraft which, it has been confirmed, meet the requirements specified in the European Aviation Safety Agency (EASA) Acceptable Means of Compliance (AMC) 20-24 or equivalent.

6 — REFERENCE DOCUMENTATION

6:A — DOCUMENTS PROMULGATED BY THE NAT SPG

These documents are intended as reference for operators and service providers in the ICAO NAT Region and for their respective regulators.

Number	Title	Current edition/version	Kept under review by	Amendments approved by	Remarks
NAT Doc 001	NAT SPG Handbook	Version 2.3.0 – June 2018	ICAO Secretariat	NAT SPG*	Except for the following: * *1 — 13 – NAT SPG Representatives*: kept up-to-date by the Secretariat upon reception of nomination to the NAT SPG. * 6 – Reference Documentation: kept up-to-date by the Secretariat, upon approval or revision of a NAT Document promulgated by the NAT SPG.
NAT Doc 002	*Discontinued*				*Superseded by the Pan-Regional (APAC and NAT) Interface Control Document for ATS Inter-facility Data Communication (PAN ICD AIDC)*
NAT Doc 003	High Frequency Management Guidance Material for the North Atlantic Region	Version 3.0 – June 2015	NAT POG in coordination with NAT TIG	NAT IMG	
NAT Doc 004	Common Aeradio Communications Interface Control Document	Version 1.4 – Nov. 2011	NAT TIG	NAT IMG	

Number	Title	Current edition/version	Kept under review by	Amendments approved by	Remarks
NAT Doc 005	Future ATM Concept of Operations for the North Atlantic Region	2nd Edition,– Nov. 2012	NAT IMG	NAT SPG	
NAT Doc 006 - Part I	Air Traffic Management Operational Contingency Plan – North Atlantic Region	Version 1.~~11~~12 – July 201~~8~~9	NAT IMG	NAT SPG	
- Part II EUR/NAT VACP	Volcanic Ash Contingency Plan – Europe and North Atlantic Regions	Version 2.0.0 – July 2016	NAT IMG and EANPG COG in accordance with the process described in the body of the document –	Coordinated approval of main document body by both NAT SPG and EANPG	
NAT Doc 007	North Atlantic Operations and Airspace Manual	Version ~~V-2018-2 – July 2018~~ V-2019-3 - July 2019	NAT POG and NAT DMO, Except for the following: *Attachment 6 – Flight Level Allocation Scheme (FLAS)*: kept under review by the NAT POG	NAT SPG, Except for the following: *Attachment 6 – Flight Level Allocation Scheme (FLAS)*: revision approved by NAT IMG	Information in NAT Doc 007 complements and does not contradict, the information contained in the NAT Oceanic Errors Safety Bulletin (OESB) .
NAT Doc 008 NAT ASM	Application of Separation Minima – North Atlantic Region (NAT ASM)	Version 1.~~8~~7 – ~~April 2017~~ December 2018	NAT POG	NAT IMG after coordination with NAT SOG	

Number	Title	Current edition/version	Kept under review by	Amendments approved by	Remarks
NAT Doc 009	*Discontinued*				*Integrated in NAT eANP Volume III, Companion Document, NAT GANP/ASBU Report (NAT eANP Volume III approval: NAT SPG Conclusion 53/21 refers).*
NAT Doc 010	Consolidated Reporting Responsibilities Handbook – North Atlantic Region	~~Provisional Edition – 2015~~ June 2019	NAT SOG and NAT IMG	NAT SPG	
NAT eANP Vol III (ICAO Doc 9634, Vol III)	Volume III of the electronic Air Navigation Plan – North Atlantic Region	2017 – June 2018	NAT IMG and its contributory groups	NAT SPG	
NAT eANP Vol III - Part 2 and 3	GANP ASBU Implementation Status Report – NAT Region	2017 – June 2018	ICAO Secretariat in coordination with NAT IMG	NAT SPG	
	Minimum Monitoring Requirements: North Atlantic RVSM	29 June 2010	NAT CMA -	NAT SOG	

Number	Title	Current edition/version	Kept under review by	Amendments approved by	Remarks
NAT OPS Bulletins * *YYYY_nnn*	NAT Operations Bulletins	The *NAT OPS Bulletins Checklist* lists the currently valid NAT OPS Bulletins.	Content is managed by originators. Originators are noted on the cover pages.		*NAT Ops Bulletins are used to distribute information on behalf of the North Atlantic Systems Planning Group (NAT SPG). The material contained therein may be developed within the working structure of the NAT SPG or be third party documents posted at the request of a NAT SPG Member State.*
	NAT OESB - NAT Oceanic Errors Safety Bulletin	NAT OPS Bulletin 2017_002_rev1	NAT SG	NAT SOG	*The NAT Oceanic Error Safety (OES) Bulletin (NAT OESB) is used to distribute information on best practices used to avoid errors when operating in the NAT Region. The NAT OESB is mainly addressed to the attention of pilots, dispatchers, industry and training centers. It complements and does not contradict, the guidance detailed in the current edition of North Atlantic Operations and Airspace Manual (NAT Doc 007).*
	NAT OESB Supplements - NAT Sample Oceanic Checklists	NAT OPS Bulletin 2017_005	NAT SG	NAT SOG	*The NAT Sample Oceanic Checklist (NAT SOC) is a companion document of the NAT OESB.*

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* *All currently valid NAT OPS Bulletins and Checklist are at: www.icao.int/EURNAT/EUR & NAT Documents, then NAT Documents, then NAT Ops Bulletins.*

APPENDIX A — NAT REGIONAL SAFETY CASE TEMPLATE

(C 55/19 - NAT SPG/55 June 2019)

NAT Regional Safety
Case

[TITLE]

[DATE]

Document Change Page

Date	Change Summary	Version Number

Section 1. Executive Summary

This section should clearly define the purpose of the regional change proposal including a summary of the hardware/software system, operation, or procedures that constitutes the change. If applicable, include elements of the issues that make it particularly unique or challenging in the NAT region.

Section 2. NAT Safety Case Components

This section should adequately address the definition and components of a regional safety case in support of changes to the NAT air navigation system requiring NAT SPG approval outlined in NAT SPG conclusion 53/16 and documented in NAT SPG Handbook, NAT Doc 001.

A. Change Advocate(s)

List the NAT SPG sub-group(s) or Air Navigation Service Provider(s) proposing the NAT change.

B. Description of and Rationale for Proposed Change

Clearly describe the proposed NAT change and the rationale for the proposed change.

C. NAT Airspace System Assurance

Provide assurance that the proposed change will fit the NAT airspace system and that all common aspects of the implementing FIRs have been addressed.

D. Regional Safety Assessment

Describe the regional safety assessment methodology and include, as a minimum, the identification of hazards common to the NAT region (or the FIRs affected by the change), the risk assessment, and the proposed risk controls and/or mitigations applicable to the NAT region.

E. Conclusion of Safety Assessment

Provide a conclusion showing that the evidence and argument demonstrate the proposed change(s) increases neither the overall risk associated with the NAT, nor increases the risks associated with any component part of the NAT system beyond acceptable levels and/or established NAT safety performance targets.

F. Post-implementation Monitoring and Reversion Plan

Describe the post-implementation monitoring plan and reversion plan for the identified hazards. This section may also include information on required or proposed monitoring activities to be carried out by the NAT region.

G. Supporting Evidence

List the relevant supporting evidence related to the proposed change(s). Important evidence necessary to support a NAT Safety Case review should be included in Section 4 of this document.

H. State Approvals/Requirements

Identify the necessary State approvals and/or other State requirements necessary to accommodate the change and assurance that those will be in place prior to implementation.

Section 3. NAT Safety Case Terms and Definitions

Term	Definition	Source
Assessment	An evaluation based on engineering, operational judgement, and/or analysis methods. (An appraisal of procedures or operations based largely on experience and professional judgement.)	ESARR4
Change Proponent	The State/organization within the NAT that is proposing or sponsoring a change or means to address an identified existing safety issue.	
Risk Control	Activities that ensure that safety policies, procedures, and processes minimize the risk of an aviation accident or incident.	SM ICG[2]
Hazard	A condition or an object with the potential to cause or contribute to an aircraft incident or accident	ICAO Annex
Hazard Analysis	Analysis performed to identify hazards, hazard effects, and hazard causal factors used to determine system risk.	SM ICG
Hazard Identification	A process to establish a list of all hazards relevant to the activity and the causes/threats that could release them	SM ICG
Risk Mitigation	The process of incorporating defences, preventive controls or recovery measures to lower the severity and/or likelihood of a hazard's projected consequence.	ICAO 9859 Safety Managemen
Monitoring	Tracking and keeping hazard information under systematic review.	FAA 8000.72
Risk Analysis	Process whereby possible consequences of hazards are objectively characterized for their severity and probability. The process can be qualitative and/or quantitative.	SM ICG
Risk Assessment	The identification, evaluation, and estimation of the level of risk.	SM ICG
Safety Assessment	A systematic, comprehensive evaluation of an implemented system to show that the safety requirements are met.	CAP728
Safety Case	A documented body of evidence that provides a demonstrable and valid argument that a system is adequately safe for a given application and environment over its lifetime.	CAP760, SM ICG
Safety Risk	The predicted probability and severity of the consequences or outcomes of a hazard.	ICAO Annex
Safety Performance Target	The State or service provider's planned or intended target for a safety performance indicator over a given period that aligns with the safety objectives. See Safety Performance Indicator.	ICAO Annex 19
Safety Performance Indicator	A data-based parameter used for monitoring and assessing safety performance. See also Safety	ICAO Annex 19
Severity	The extent of loss or harm associated with consequences of a hazard.	SM ICG
Likelihood	The frequency, in quantitative or qualitative terms, that an unsafe event may occur.	SM ICG
Acceptable Risk	The level of risk that individuals or groups are willing to accept given the benefits gained. Each organization will have its own acceptable risk level, which is derived from its legal and regulatory compliance responsibilities, its threat profile, and its business/organizational drivers and impacts.	SM ICG
NAT SOG review	The NAT SOG monitoring of a regional safety case and review of a completed regional safety case is intended to provide assurance to the NAT SPG that identified risk has been managed, mitigations have or will be implemented and that adequate provision are made for post-implementation monitoring to verify that the defined level of safety on a regional basis continues to be met.	

[2] Safety Management International Collaboration Group

Section 4. Appendices

Provide relevant supporting evidence related to the proposed change(s) to support a NAT Safety Case review, e.g. Concept of Operations.

LIST OF ACRONYMS

AAD	Assigned Altitude Deviation
ADS	
ADS–B	Automatic Dependent Surveillance – Broadcast
AMC	Acceptable Means of Compliance
ANP	Air Navigation Plan
ASBU	Aviation System Block Upgrade
ASE	Altimetry System Error
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATM	Air Traffic Management
CNS	Communications, Navigation and Surveillance
Doc 10004	*Global Aviation Safety Plan* (GASP)
Doc 10037	*ICAO Global Operational Data Link* (GOLD) *Manual*
Doc 7030	*ICAO Regional Supplementary Procedures* (SUPPs)
Doc 9574	*Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive*
Doc 9750	*Global Air Navigation Plan* (GANP)
Doc 9869	*Performance-Based Communication and Surveillance (PBCS) Manual*
EANPG	European Air Navigation Planning Group
EANPG COG	EANPG Programme Coordinating Group
EASA	European Aviation Safety Agency
EUR/NAT	European and North Atlantic
fapfh	Fatal accidents per flight hour
FIR	Flight Information Region
FLAS	Flight Level Allocation Scheme
GANP	*Global Air Navigation Plan* (Doc 9750)
GASP	*Global Aviation Safety Plan* (Doc 10004)
GNE	Gross Navigation Error
GOLD	*ICAO Global Operational Data Link Manual* (Doc 10037)
IAOPA	International Council of Aircraft Owners and Pilot Associations
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' Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
KPI	Key Performance Indicator
LHD	Large Height Deviation
NAT CMA	North Atlantic Central Monitoring Agency
NAT DLMA	North Atlantic Data Link Monitoring Agency
NAT DMO	North Atlantic Document Management Office
NAT EFFG	North Atlantic Economic, Financial and Forecast Group
NAT HLA	NAT High Level Airspace
NAT IMG	North Atlantic Implementation Management Group

NAT MWG	North Atlantic Mathematicians' Working Group
NAT POG	North Atlantic Procedures and Operations Group
NAT SDR	*North Atlantic Services Development Roadmap* (NAT Doc 009) - *DISCONTINUED*
NAT SG	North Atlantic Scrutiny Group
NAT SOC	NAT Sample Oceanic Checklist
NAT SOG	North AtlanticSafety Oversight Group
NAT SPG	North Atlantic Systems Planning Group
NAT TIG	North Atlantic Technology and Interoperability Group
NFTP	NAT Fast Track Procedure
NM	Nautical Miles
OESB	Oceanic Errors Safety Bulletin
PAN ICD AIDC	*Pan-Regional (APAC and NAT) Interface Control Document for ATS Inter-facility Data Communication*
PBCS	Performance-Based Communication and Surveillance
PfA	Proposal for amendment
PIRG	Planning and Implementation Regional Group
RMA	Regional Monitoring Agency
RVSM	Reduced Vertical Separation Minimum
SLOP	Strategic Lateral Offset Procedures
SUPPs	*ICAO Regional Supplementary Procedures* (Doc 7030)
TLS	Target Level of Safety
ToR	Terms of Reference
TVE	Total Vertical Error
VSM	Vertical Separation Minimum

— END —

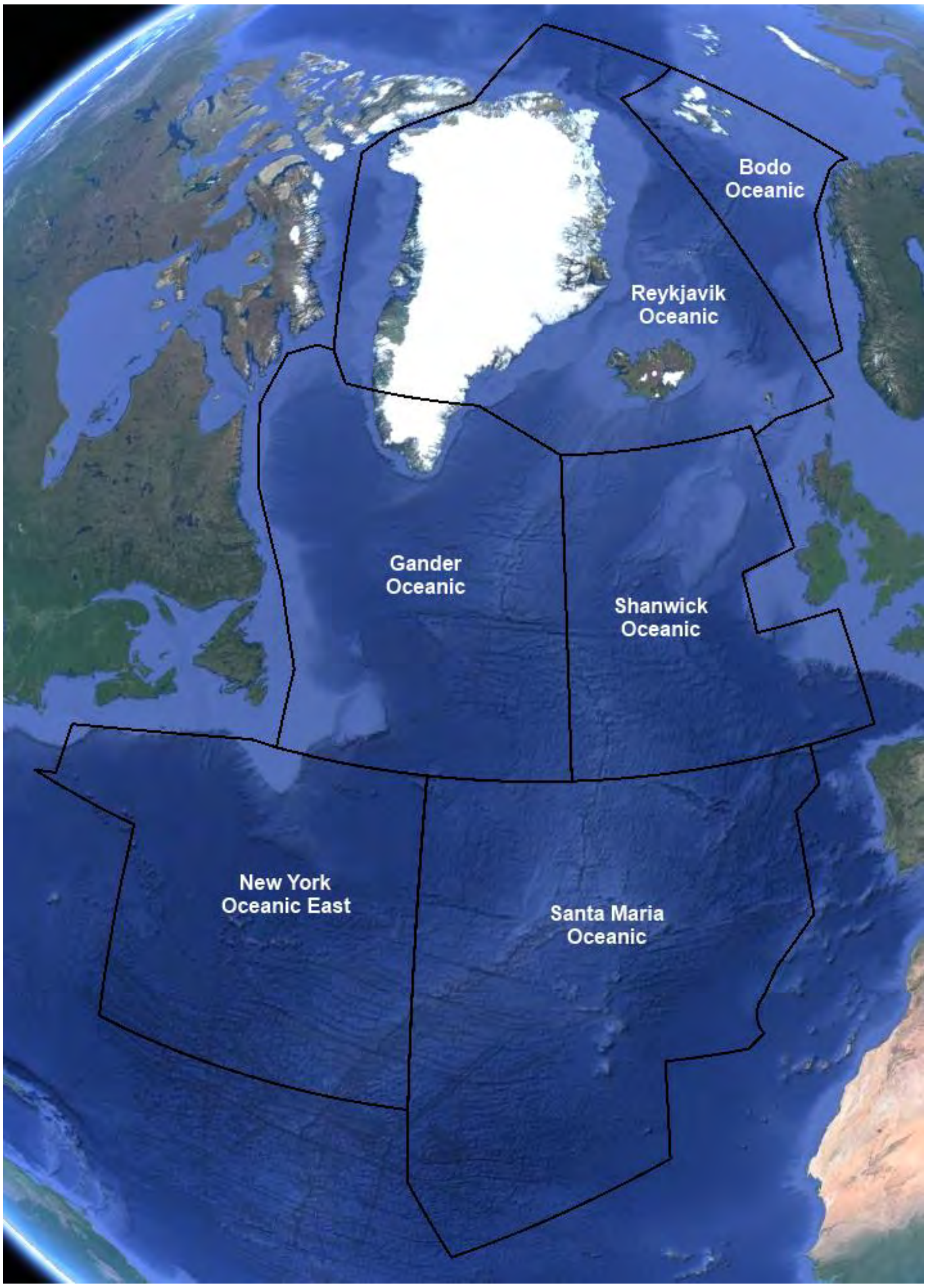
APPENDIX Q — UPDATES TO THE AIR TRAFFIC MANAGEMENT OPERATIONAL CONTINGENCY PLAN – NAT REGION (NAT DOC 006, PART I)

(*paragraph 5.4.3 refers*)

STARTS ON NEXT PAGE

AIR TRAFFIC MANAGEMENT OPERATIONAL CONTINGENCY PLAN

NORTH ATLANTIC REGION



First Edition

Amendment 12 – July 2019

Published on behalf of the North Atlantic Systems Planning Group (NAT SPG)
by the European and North Atlantic Office of ICAO

EXCLUSION OF LIABILITY

First published : 22 October 2009

TABLE OF CONTENTS

FOREWORD

This Document is for guidance only. Regulatory material relating to North Atlantic aircraft operations is contained in relevant ICAO Annexes, PANS/ATM (Doc.4444), Regional Supplementary Procedures (Doc.7030), State AIPs and current NOTAMs, which should be read in conjunction with the material contained in this Document.

The North Atlantic region is busiest oceanic airspace in the world, extending from the north pole to 27N and spanning the high seas between Europe and North America. In 2008 in excess of 450,000 flights transited the airspace. The Organised Track Structure accommodates a high concentration of traffic which regularly sees traffic flows in excess of 100 flights per hour. Control of traffic in this vast and complex airspace is delegated to a number of states, with their Oceanic Control facilities geographically dispersed.

The North Atlantic Air Traffic Management Operational Contingency Plan is primarily for the information of operators and pilots planning and conducting operations in North Atlantic region. The intent is to provide a description of the arrangements in place to deal with a range of contingency situations.

The Manual has been produced with the approval and on behalf of the North Atlantic Systems Planning Group (NAT SPG); a North Atlantic regional planning body established under the auspices of the International Civil Aviation Organisation (ICAO). This Group is responsible for developing the required operational procedures; specifying the necessary services and facilities and; defining the aircraft and operator approval standards employed in the NAT Region.

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This Document will be made available to users from a number of web sites including the ICAO EUR/NAT website http://www.icao.int/EURNAT/, following "EUR & NAT Documents", then "NAT Documents", in folder "NAT Doc 006 - NAT Contingency Plan".

To assist with the editing of this Manual and to ensure the currency and accuracy of future editions it would be appreciated if readers would submit their comments/suggestions for possible amendments/additions, to the ICAO EUR/NAT Office at the above Email address.

RECORD OF AMENDMENTS

Amdt. Number	Effective Date	Details
01	01 February 2010	
02	11 March 2010	**Chapter 7 – Detailed procedures – Shannon ACC** To account for amended contingency procedures in Shannon
03	10 January 2011	**Chapter 2 – Detailed procedures – Gander OACC** a) updates to take account of the provision of ADS-B services over Greenland; (2.4.1, 2.4.2, new 2.6.4, 2.8, new 2.9 and new Appendices D, E and F); b) correction of ATSU indicator for Prestwick Centre, for aircraft to manually complete the AFN logon for ADS-C (2.6.2 and 2.6.3); c) correction to the telephone number and SATCOM Imarsat short code for Reykjavik (2.6.2); and d) clarification of flight crew actions to be taken to provide position reports if unable to establish radio contact (2.6.2 and 2.6.3). **Chapter 6 – Detailed procedures – Bodø OACC** a) addition of material related to notification procedures (new 6.3); b) explanations regarding situations that could lead to limited or no service (6.4 and 6.5); c) amended information concerning actions by Bodø OACC in the event that the ability to provide services is disrupted (6.4.2); d) correction to the telephone number and SATCOM Imarsat short code for Reykjavik (6.6.1); e) change of telephone number for Bodø (6.6.1); f) addition of additional guidance concerning use of flight levels (6.5.2 and 6.7.1); g) addition of contact details (new Appendix B); h) addition of example evacuation messages (new Appendix C); and i) editorial changes for consistency and readability. **Chapter 7 – Detailed procedures – Shannon ACC** a) updates to take account of the introduction of new Tango route T213 on 18 November 2010; and b) editorial changes for readability and consistency. **Chapter 8 – Detailed procedures – Brest ACC** a) updated frequencies for Paris, Reims and Bordeaux ACCs; and editorial change for consistency.

Amdt. Number	Effective Date	Details
04	24 June 2011	**Editorial** Correct all instances of "Imarsat" to "Inmarsat" Amend telephone numbers to replace leading "00" with "+" **Chapter 1 – Detailed Procedures – Shanwick OACC** a) Update contact information for Reykjavik OACC (1.6.2) **Chapter 2 – Detailed Procedures – Gander OACC** a) Update contact information for Reykjavik OACC (2.6.2) b) Correct contingency landfall routings for eastbound aircraft (2.7) c) Correct "Søndrestrøm Radio" to "Søndrestrøm FIC" (Appendix C) **Chapter 3 – Detailed Procedures – Reykjavik OACC** a) Delete mention of Montreal Radio, which does not exist (3.4.2 and 3.5.2) b) Add contact information for Iceland Radio (3.6.1) c) Update entry and email for Gannet, which is now Iceland Radio (Appendix B) **Chapter 6 – Detailed Procedures – Bodø OACC** a) Update contact information for Reykjavik OACC (6.2.1) b) Add contact information for Gander Radio (6.2.1)
Corr	07 July 2011	Corrigendum Section 1.7.2 – Shannon FIR chart corrected
05	17 February 2012	**Chapter 2 – Detailed procedures – Gander OACC** a) clarification of the criteria and requirements for routing aircraft to avoid Gander airspace (2.5.1); b) instructions for flight crews which are applicable to westbound and eastbound flights in the Gander OCA moved to the General section (2.6.1, 2.6.2, 2.6.3 and 2.6.4); c) updates to frequencies associated with specific contingency routes (2.7); d) deletion of charts depicting contingency route structures (2.7); e) removal of duplicate telephone numbers for Gander Oceanic and update of telephone number for the NAV Canada Operations Centre (Chapter 2, Appendix B)

Amdt. Number	Effective Date	Details
06	15 May 2012	**Chapter 3 – Detailed procedures – Reykjavik OACC** Updates and corrections to contact information (table at 3.6.1 and Appendix B)
Corr	19 March 2013	**ATM Contingency Plan for Flights operating within the North Atlantic Oceanic Control Area – Objective** *Page 1, 1st paragraph, 4th line : reference to paragraph corrected to read "paragraph 2.30" instead of 2.29*
07	31 July 2013	**Editorial** All instances of "Bodo" and "Bodö" corrected to "Bodø" for consistency All instances of "Söndreström" corrected to "Søndrestrøm" for consistency Amendment number and related date on front page "Part 1" replaced by "Part I", "Part 2" replaced by "Part II" for consistency Mention of Part I moved from footer to header Date in running footer updated Misspelled words corrected Display of appendices in table of content changed for legibility **Chapter 2 – Detailed procedures – Gander OACC** *(NAT SPG Conclusion 49/21 refers)* a) additional clarification on notification of service limitations and traffic management measures (2.5) b) precision on Eastbound fights: how they should proceed depending on their Oceanic Entry Point, and update to table waypoints (2.7) **Chapter 3 – Detailed procedures – Reykjavik OACC** Update to contact details (Appendix B) : Reykjavik Shift Manager Inmarsat Satellite Phone -
Corr	04 December 2013	**PART I – CONTINGENCY SITUATIONS AFFECTING ATC FACILITIES – COMMON PROCEDURES – Traffic Information Broadcast by Aircraft (TIBA) procedures** *Page 4, 1st paragraph after title, 3rd line : reference to Annex corrected to read "Annex 11 – Air Traffic Services, Attachment B" instead of Attachment C*
08	13 November 2014	**Editorial** Footer and header **Chapter 2 – Detailed procedures – Gander OACC** (*NAT IMG/45 Summary of Discussions,* Appendix K – NAT IMG Decision 45/07 refers) a) Update to section 2.7 "Contingency Route Structure" b) Update to first paragraph of section 2.8

Amdt. Number	Effective Date	Details
09	18 December 2015	*approved by NAT SPG by correspondence, silent procedure – EUR/NAT SL 15-0601.TEC refers* **Editorial** Foreword: EUR/NAT website and location of the document **Chapter 1 – Detailed procedures – Shanwick OACC** (*NAT IMG/47 Summary of Discussions,* Appendix N – NAT IMG Decision 47/11 refers) Update to Scottish FIR and Brest FIR maps in section 1.7.2 **Chapter 8 – Detailed procedures – Brest ACC** (*NAT IMG/47 Summary of Discussions,* Appendix N – NAT IMG Decision 47/11 refers) a) in section 8.4, CFMU being renamed NMOC; b) in section 8.4, new Shanwick waypoints; c) in section 8.5, new Brest FIR map as for 1.7.2
10	01 July 2016	*Approved by NAT SPG Conclusion 52/15* Changes to contingency tracks as defined in Chapter 3.7.1. Changes to contact details for Reykjavik Oceanic Area Control Centre (OACC) in Chapter 3, Appendix B Replacement of "Eurocontrol Central Flow Management Unit (CFMU)" by the European Union Network Manager Operations Center (NMOC) throughout the text
11	01 July 2018	*Approved by NAT SPG Conclusion 54/20* Changes to procedures in Reykjavik CTA in Chapter 3.
12	01 July 2019	*Approved by NAT SPG Conclusion 55/xx* **Chapter 4 – Detailed procedures – Santa Maria OACC** Paragraphs 4.3 and 4.6: Updates to frequencies used by Santa Maria Radio Station as well as in the surveillance area. **Chapter 7 – Detailed procedures – Shannon ACC** Paragraphs 7.4 and 7.5.1: Changes to contingency tracks as defined in Chapter 7.4, XETBO replaces DOLUL, NASBA replaces NERTU, Note 2 amended to include NASBA and Changes to Shannon ACC contingency route structure. **Chapter 8 – Detailed procedures – Brest ACC** Paragraph 8.5.1: Change of contingency routing chart in view of updates to the frequencies used in the Paris ACC, Reims ACC and Bordeaux ACC.

ATM CONTINGENCY PLAN

FOR FLIGHTS OPERATING

WITHIN THE NORTH ATLANTIC OCEANIC CONTROL AREAS

Objective

The Air Traffic Management (ATM) Contingency Plan contains details of the arrangements in place to ensure, as far as possible, the continued safety of air navigation in the event of partial or total disruption of Air Traffic Services within the NAT region. This document is produced in accordance with the requirement of ICAO Annex 11 – Air Traffic Services, Chapter 2, paragraph 2.30.

This plan details both common procedures throughout the NAT region and the procedures specific to the individual ANSPs within the NAT region. The plan is presented in two parts:

Part I – Contingency Situations Affecting ATC Facilities

ATC services within the NAT region are provided from a number of geographical locations and this plan details the contingency arrangements at each of these facilities. It is considered unlikely that any physical contingency at one particular facility will affect another directly, hence in Part 1 of this document the procedures for each OACC/ACC are considered independently.

Part II – Contingency Situations Affecting Multiple FIRs

This part of the plan considers events which are likely to affect more than one facility within the NAT region. In particular these include the contingency arrangements in place to deal with;

- the airspace suffering contamination by volcanic ash.
- the steps taken to deal with a ‘mass turnback’ of traffic over the NAT region.

States and FIRs affected

This document contains contingency procedures for those Air Navigation Service Providers (ANSPs) who provide an ATC service within the NAT region, and those ANSPs whose airspace has a common boundary with the NAT region for which supporting procedures are published.

The states, FIRs and ACCs affected by this contingency plan and for which procedures are promulgated are as follows:

United Kingdom

- Shanwick Oceanic FIR (OACC)
- Scottish FIR (ACC)

Canada

- Gander Oceanic FIR (OACC)

Iceland

- Reykjavik Oceanic FIR (OACC)

Portugal

- Santa Maria Oceanic FIR (OACC)

United States

- New York Oceanic FIR (OACC)

Norway

- Bodø FIR (OACC)

Ireland

- Shannon FIR (ACC)

France

- Brest FIR (ACC)

PART I

CONTINGENCY SITUATIONS

AFFECTING ATC FACILITIES

SCOPE OF THE PLAN

This part of the Contingency Plan considers:

- Common procedures adopted by ATC facilities in the event of contingency situations.

- Detailed procedures adopted by individual ATC facilities in the event of contingency situations. The plan considers contingency situations which may result in a degradation of the ATC service provided (limited service) as well as situations where there is a total loss of the ability to provide ATC services (no service).

  Where available, information is also provided outlining the steps taken by ANSPs to deal with a long term unavailability of an ATC facility. In particular the procedures detailed by each ATC facility will, insofar as possible, comprise the following:

  - FIRs for which the Contingency Plan applies
  - FIRs with supporting procedures
  - Notification procedures
  - Implementation of the plan
  - Limited service
    - disruption of ground/air communication capability
    - disruption of ability to provide control services
  - No service
    - loss of ground/air communication capability
    - loss of ability to provide control services
  - Contingency Route Structure:
    - for activation within that OCA
    - for activation within adjacent OCA/FIR
  - Long term contingency arrangements
  - Contact details

COMMON PROCEDURES

Implementation of the plan

In the event of adoption of contingency procedures ANSPs will notify all affected agencies and operators appropriately.

In **Limited Service** situations the individual ANSP will decide upon the level of notification necessary and take action as required to cascade the information.

In **No Service** situations it is likely that the ATC facility involved will be subject to evacuation. In this instance the ANSP will issue NOTAMs and broadcast on appropriate frequencies that contingency procedures have been initiated. The notification process employed by individual ANSPs is detailed in their respective entries in this plan, however the general format will be as follows:

Issue a NOTAM advising operators of the evacuation. The following is an example of the type of information which may be promulgated:

"Due to emergency evacuation of (OACC) all ATC services are terminated. Flights within (OCA) FIR should continue as cleared and contact the next ATC agency as soon as possible. Flights not in receipt of an oceanic clearance should land at an appropriate airfield or request clearance to avoid (OAC) FIR. Flights should monitor (defined frequencies)."

Broadcast an evacuation message on appropriate frequencies:

"Emergency evacuation of (OACC) is in progress. No air traffic control service will be provided by (OACC). Use extreme caution and monitor (control frequencies), emergency frequencies and air to air frequencies. Contact the next air traffic control unit as soon as possible".

Traffic Information Broadcast by Aircraft (TIBA) procedures

The following communications procedures have been developed in accordance with the Traffic Information Broadcast by Aircraft (TIBA) procedures recommended by ICAO (Annex 11 – Air Traffic Services, Attachment B). These procedures should be applied when completing an altitude change to comply with the oceanic clearance.

At least 3 minutes prior to the commencement of a climb or descent the flight should broadcast on the last assigned frequency, 121.5, 243.0 and 123.45 the following:

"ALL STATION (callsign) (direction) DIRECT FROM (landfall fix) TO (oceanic entry point)
LEAVING FLIGHT LEVEL (number) FOR FLIGHT LEVEL (number) AT (distance)(direction) FROM (oceanic entry point) AT (time)".

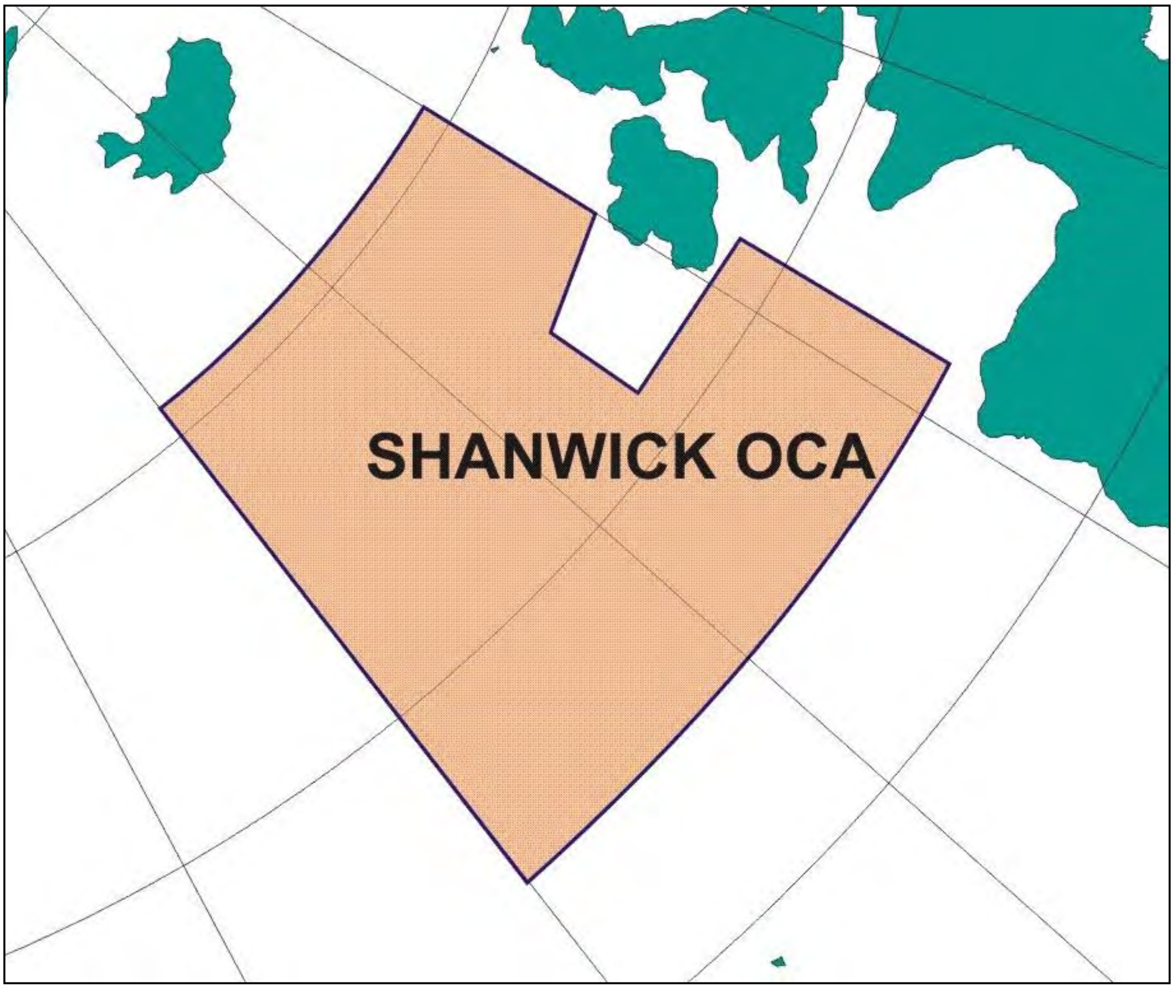
When the level change begins, the flight should make the following broadcast:

"ALL STATIONS (callsign) (direction) DIRECTION FROM (landfall fix) TO (oceanic entry point)
LEAVING FLIGHT LEVEL (number) NOW FOR FLIGHT LEVEL (number)."

When level, the flight should make the following broadcast:

"ALL STATIONS (callsign) MAINTAINING FLIGHT LEVEL (number)."

CHAPTER 1: DETAILED PROCEDURES – SHANWICK OACC



1.1 FIR FOR WHICH THE CONTINGENCY PLAN APPLIES

Shanwick Oceanic FIR

1.2 FIRs WITH SUPPORTING PROCEDURES

Gander Oceanic FIR
Shannon FIR
Scottish FIR
Brest FIR

1.3 NOTIFICATION PROCEDURES

In a limited service situation notification of any service limitations and traffic management measures will be promulgated to operators and adjacent ANSPs via AFTN.

In a no service situation the OACC is likely to have been evacuated. As soon as possible after evacuation a contingency message will be sent to agencies which receive the NAT track message. An evacuation message will be broadcast on appropriate frequencies and operators in receipt of the contingency message are asked to forward this information to affected flights wherever possible.

1.4 LIMITED SERVICE - PROCEDURES

1.4.1 Disruption of ground/air communication capability

A limited communication service will be maintained with the assistance of adjacent Aeronautical Radio Stations. HF services on the North Atlantic normally provided by Shanwick Radio (EIAA) will be delegated as appropriate to the other Aeronautical Radio Stations namely Iceland Radio, Gander Radio, Santa Maria Radio and New York AIRNC. Appropriate frequencies will be advised by Shanwick Radio and the assisting stations.

Situations which could result in a Limited Service are:

Equipment Failure

Transmitters (Loss of a number of Transmitters)
Receivers (Loss of a number of Receivers)
Aerials (Loss of a number of Aerials)
Data Lines (Loss of data lines between Shanwick Radio and Shanwick OACC)
ROFDS (Telephone Contact with Prestwick available to assist Aircraft with an emergency)

Propagation

Radio Propagation resulting in partial fade-out can be affected by many factors including Solar Flares and Geomagnetic Storms

Staffing

Reduced Staffing
Illness
Weather (Severe Weather i.e. Storm, Snow, Flooding)
Industrial Relations issues

ADS/CPDLC/FMC/ORCA Failure

Resulting in increased HF congestion as flights revert to voice communications.

Security Threat

Depending on the level of the Security threat and if essential staff are allowed to remain on Station

Effect on flights

Shanwick Radio and Iceland Radio provide joint communications for Shanwick and Reykjavik/Søndrestrøm Oceanic Areas resulting in a virtual radio station for the North Atlantic from 45N to the North Pole. Radio Operators work flights in either area, updating both Shanwick and Reykjavik Control Centres.

Joint Operations between Shanwick Radio and Iceland Radio increases the ability to provide a 'normal' service with assistance from adjacent aeronautical stations.

In the event that the operation is degraded substantially, ATFM measures may be imposed as necessary.

In the event of ADS/CPDLC/ORCA failure, flights will revert to HF/VHF/SATCOM causing frequency congestion which may result in ATFM measures being imposed as necessary.

1.4.2 Disruption of ability to provide control services

Shanwick shall determine, co-ordinate and promulgate any necessary restrictions to meet the service limitation. Traffic in possession of a valid oceanic clearance shall have priority over any other traffic. Enroute reclearance of such traffic shall not be permitted except in emergency.

Traffic without a valid oceanic clearance may be subject to tactical traffic management measurements to meet the requirements of the service limitation.

Separation standards

Shanwick will be responsible for ensuring the co-ordination and implementation of any additional separation requirements.

Contingency tracks

Dependant on the nature of the service limitation, Shanwick may promulgate and activate contingency tracks for use in addition to the OTS.

Air Traffic Flow Management

Shanwick shall co-ordinate any necessary traffic management measures where necessary with the London Network Management Cell (NMC) and/or the NMOC. Such measures may include, but are not limited to, temporary capacity restrictions and tactical rerouteing measures.

Shanwick shall co-ordinate these restrictions where necessary with adjacent ANSPs where they may affect the flow of traffic through these units airspace.

Responsibilities of adjacent ANSPs

The action required of adjacent ANSPs will vary dependant on the nature of the service limitation. Where such action is not contained within the inter-centre Letters of Agreement (LOAs) the requirement will be promulgated within the initial failure and restrictions message.

1.5 NO SERVICE - PROCEDURES

1.5.1 Loss of ground/aircommunication capability

Shanwick Radio and Iceland Radio provide joint radio operations for Shanwick and Reykjavik Oceanic Areas resulting in a virtual radio station for the North Atlantic from 45N to the North Pole.

In the event of Shanwick Radio being unable to provide ground/air communications for Shanwick OCA Iceland Radio will coordinate with adjacent aeronautical radio stations of the NAT region to provide ground/communications to the best of their ability.

Situations which could result in No Service being provided are:

Equipment Failure

Transmitters (Loss of all Transmitters)
Receivers (Loss of all Receivers)
Aerials (Loss of all Aerials)
Data Lines (Loss of data lines between Shanwick Radio and Shanwick OACC)
ROFDS

Propagation

Radio Propagation resulting in total fade-out which can be caused by many factors including Solar Flares and Geomagnetic Storms

Staffing

No Staff
Ilness (Seasonal Influenza)
Weather
Industrial Relations issues

Evacuation of Radio Station

Fire
Bomb threat

Effect on flights

Shanwick Radio and Iceland Radio provide joint communications for Shanwick and Reykjavik/Søndrestrøm Oceanic Areas resulting in a virtual radio station for the North Atlantic from 45N to the North Pole. Radio Operators work flights in either area, updating both Shanwick and Reykjavik Control Centres.

In the event of Shanwick Radio being unable to provide ground/air communications for a sustained period of time Iceland Radio in coordination with adjacent aeronautical stations could provide a limited communications facility to flights in the Shanwick OCA.

ATFM measures may be imposed as necessary.

1.5.2 Loss of ability to provide control services

Scottish and Oceanic Area Control Centre includes both Scottish Radar and Shanwick Oceanic Control. Should Shanwick OACC be evacuated the potential would exist for a major disruption to Air Traffic Control (ATC) within the Shanwick OCA and Scottish Radar units.

The HF radio communications for the Shanwick Oceanic Centre are remotely located, so will not be affected.

In the event that Shanwick OACC is evacuated, Gander Oceanic will assume responsibility for the provision of Air Traffic Services (ATS) within the Shanwick OCA to the best of their ability. The procedures to be adopted by Gander are detailed at 'Shanwick Detailed Procedures - Appendix A.'

As soon as possible after evacuation a contingency message will be sent to the agencies that receive the NAT track message, detailed in 'Shanwick Detailed Procedures - Appendix C.' In turn they are expected to advise the affected traffic.

HF congestion is likely. Communications should be kept to a necessary minimum. Unnecessary routeing changes will not be issued.

Other ATSUs will provide guidance as far as possible in the circumstances.

Contact information that may be used in the event of an emergency evacuation is provided in Appendix B.

1.6 FLIGHT CREW AND OPERATOR PROCEDURES

1.6.1 For flights within the Shanwick OCA – General

The procedures outlined below are to be used as guidance for pilots in the immediate aftermath of a sudden withdrawal of the ATC service as described above.

On receipt of the contingency message pilots are requested to broadcast to other flights on 121.5 and 123.45. A listening watch on these frequencies must be maintained.

1.6.2 For flights within the Shanwick OCA – Westbound

Gander OACC will endeavour to provide an ATC service throughout the Shanwick OCA as soon as evacuation commences. These procedures are detailed at 'Shanwick Detailed Procedures - Appendix A.'

Flights should establish communication with the next agency at the earliest opportunity stating current position, cleared flight level, next position and estimate and subsequent position. This also applies to flights using automatic position reports (ADS/FMC) as these reports may not have been received by the next agency.

When ADS equipped flights are notified of a Shanwick evacuation they must revert to voice position reporting until clear of Shanwick OCA, or notified otherwise. Pilots should note that they may be asked to log-on to CYQX when within the Shanwick OCA, they should not initiate this action until instructed to do so.

Any flights involved in level changes should complete the manoeuvre as soon as possible in accordance with the clearance.

If unable to establish radio contact, flights may use SATCOM voice or satellite telephone to provide position reports.

Oceanic Centre	Telephone Number	SATCOM Inmarsat Short Code
Gander	+1 709 651 5207	431613
Reykjavik, via Iceland Radio	+354 568 4600	425105
Santa Maria	+351 296 820 438 +351 296 886 042 (satellite link)	426305
New York	+1 631 468 1413	436623

Oceanic Centre	Telephone Number	SATCOM Inmarsat Short Code
Ballygirreen (Shanwick Aeradio)	+353 61 368241 Ground/Air Ops +353 61 471199 Ground/Air Ops via Switchboard	425002

Flights may request their flight dispatch offices to forward position reports, if sending position reports to multiple ATS Units or if otherwise unable to forward position reports.

1.6.3 For flights within the Shanwick OCA – Eastbound

Gander OACC will endeavour to provide an ATC service throughout the Shanwick OCA as soon as evacuation commences. These procedures are detailed at 'Shanwick Detailed Procedures - Appendix A.'

Flights operating with a received and acknowledged oceanic clearance will be expected to continue in accordance with the last clearance issued unless otherwise advised by ATC.

When ADS equipped flights are notified of a Shanwick evacuation they must revert to voice position reporting until clear of Shanwick OCA, or notified otherwise. Pilots should note that they may be asked to log-on to CYQX when within the Shanwick OCA, they should not initiate this action until instructed to do so.

Any flights involved in level changes should complete the manoeuvre as soon as possible in accordance with the clearance.

If unable to establish radio contact, flights may use SATCOM voice or satellite telephone to provide position reports using the telephone numbers listed above.

Flights making automatic position reports are required to make voice position reports whilst within the Shanwick OCA, unless advised otherwise.

Communications with the next ATSU should be established at the earliest opportunity. Where no contact with the next agency can be established, Shanwick radio should be contacted on HF for advice.

1.6.4 For flights approaching the Shanwick OCA when the contingency is activated

Not in Receipt of an Oceanic Clearance

In the event that Shanwick OACC must be evacuated, only aircraft with received and acknowledged oceanic clearances shall be permitted to transit Shanwick OCA.

If unable to obtain or acknowledge an oceanic clearance, flights should plan to re-route around the Shanwick OCA or to land at an appropriate airfield.

In receipt of an acknowledged Oceanic Clearance outside Scottish FIR

Aircraft operating with a received and acknowledged oceanic clearance can, at pilot's discretion, continue, but must expect a limited ATC service within the Shanwick FIR. Due to the remote location of the HF service provider communications will be unaffected.

However, due to the uncertainty surrounding the contingency situation pilots are strongly advised to comply with the procedures detailed above for flights not in receipt of an oceanic clearance even if they are in receipt of an acknowledged Oceanic clearance.

In receipt of an acknowledged Oceanic Clearance within Scottish FIR

Within the Scottish FIR, if the pilot elects to continue, the flight must be operated in accordance with the last received and acknowledged Oceanic clearance from eastern boundary until last specified route point, normally landfall.

It is probable that the Scottish ACC will have been evacuated along with Shanwick OACC. In this event, whilst operating within the Scottish FIR, all flights are requested to make position reports on the last assigned frequency, stating position, level and next fix. The following airfield frequencies may also be used:

Airfield	VHF Approach Frequency
Glasgow	119.1
Edinburgh	121.2
Aberdeen	119.05
Prestwick	120.55
Belfast Aldergrave	128.5

1.6.5 Entering from another OCA

Flights within Reykjavik or Santa Maria oceanic airspace, can anticipate a large re-route to avoid the Shanwick OCA and Scottish FIR. Reykjavik and Santa Maria will issue advise on procedures to be followed.

1.7 SHANWICK OACC – CONTINGENCY ROUTE STRUCTURE

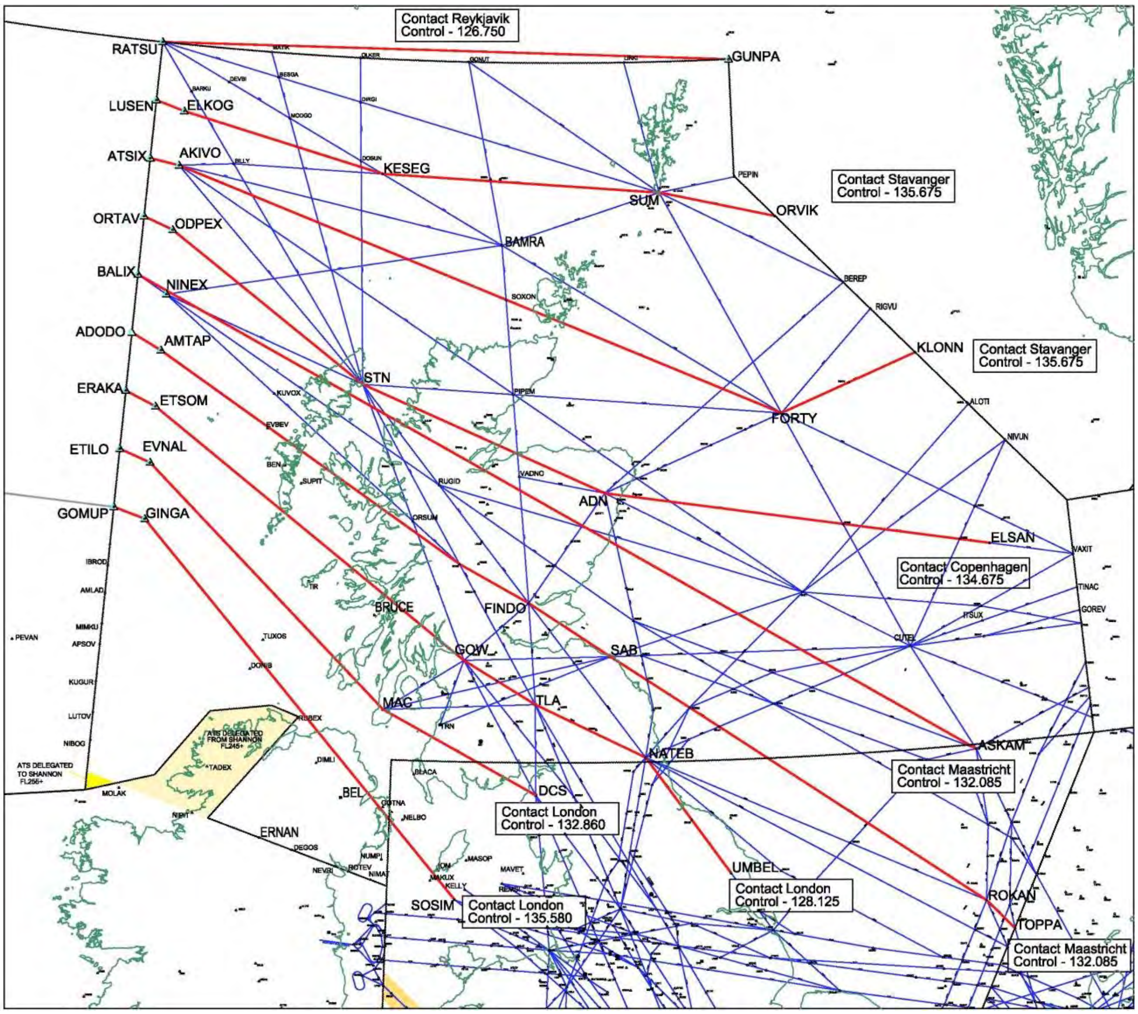
1.7.1 For activation within Shanwick OCA

In a **limited service** contingency situation Shanwick OACC may promulgate additional contingency tracks in addition to the published OTS. Due to the dynamic nature of the NAT OTS it is not possible to publish such tracks in advance. Any contingency track design within the Shanwick OCA will be effected at the time of the event and be dependent on the nature of the service limitation. Promulgation will be via AFTN.

1.7.2 For activation within adjacent OCA/FIR

Scottish FIR

Unless instructed otherwise, flights entering the Scottish FIR should use the following contingency routes:

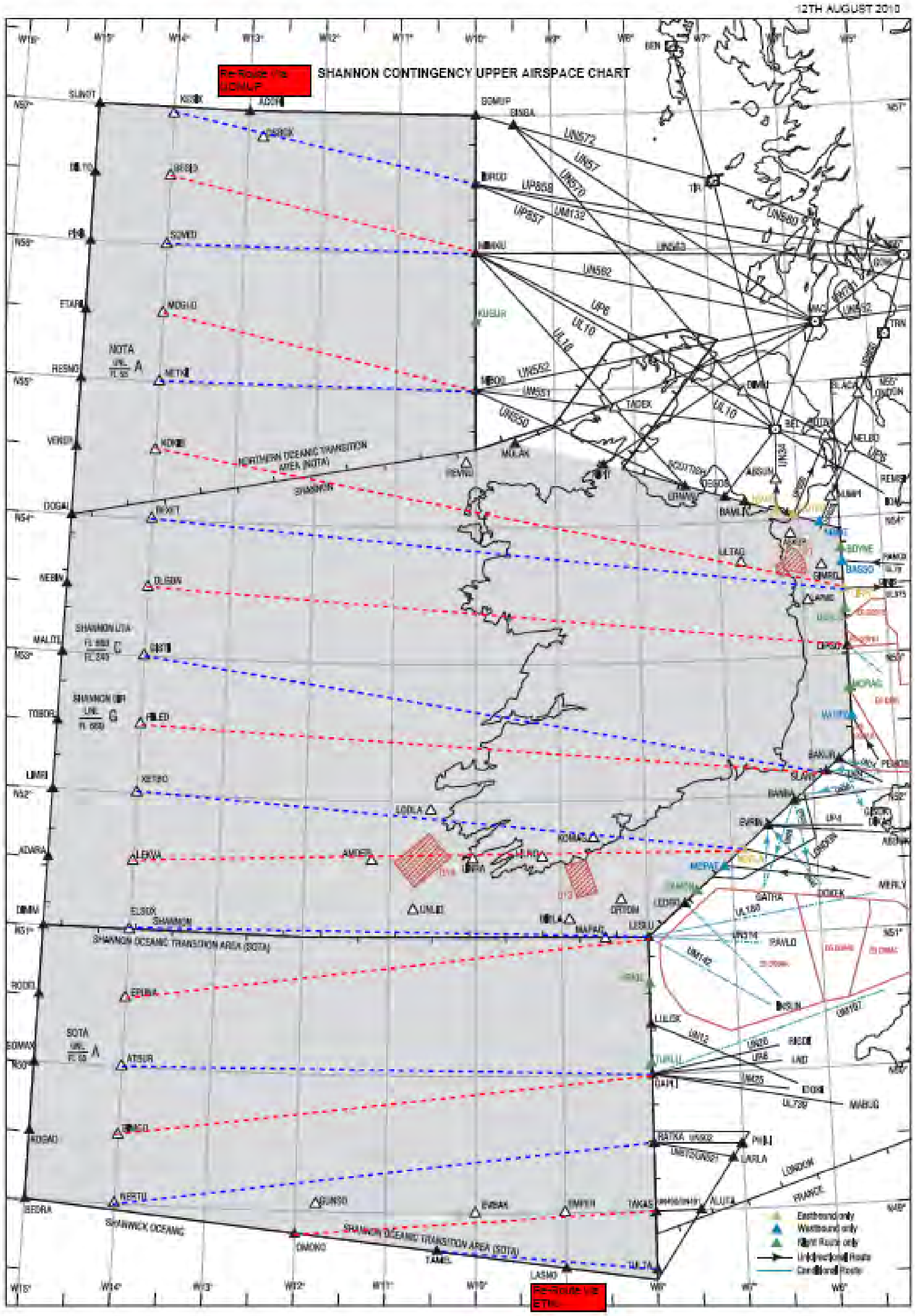


Communications with the next ATSU should be established at the earliest opportunity.

Flights operating close to the Reykjavik or Shannon northern boundaries should, where possible, establish communications with those units in order to negotiate a reroute to avoid the Scottish FIR.

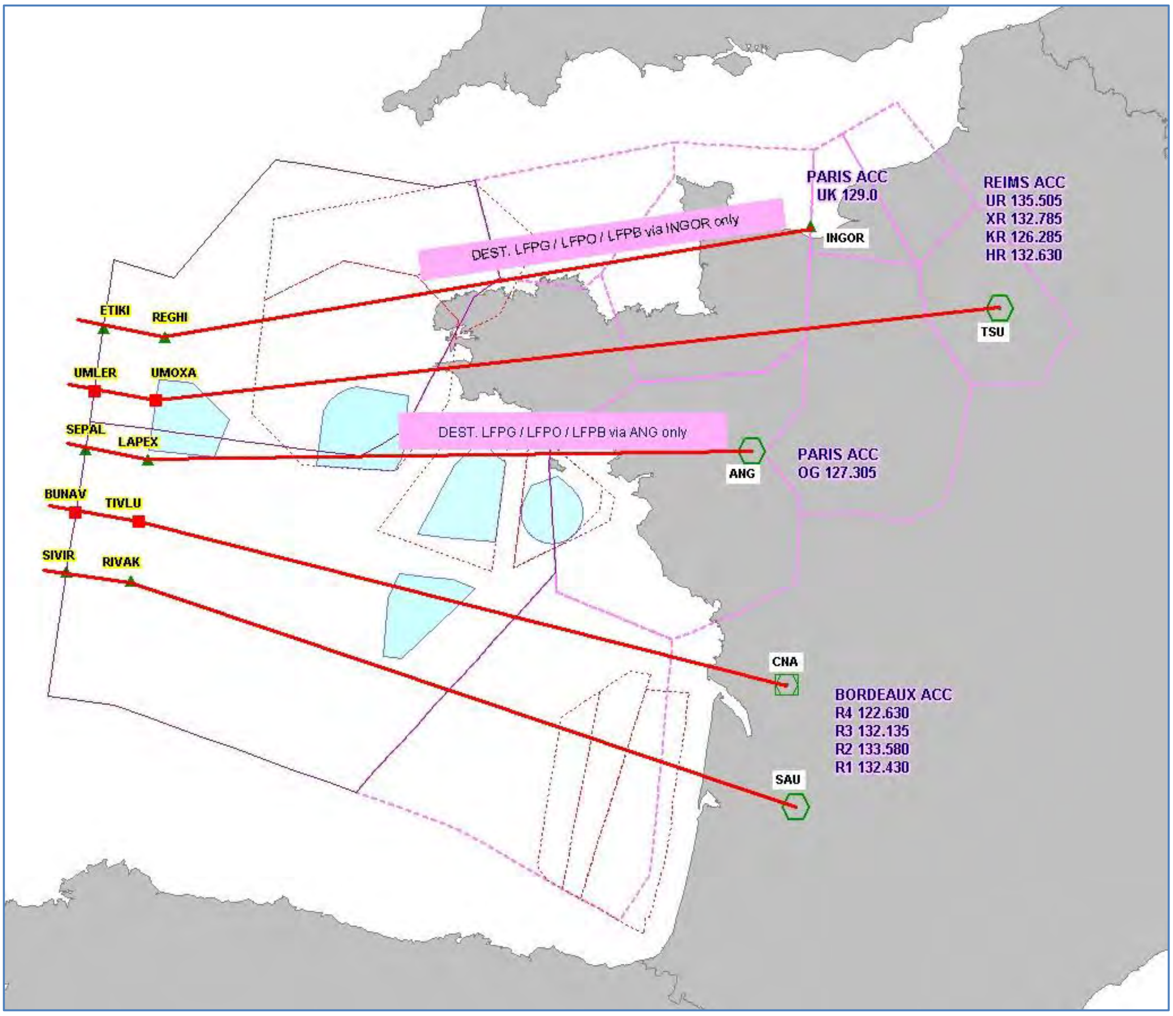
Shannon FIR

Unless instructed otherwise, flights entering the Shannon FIR should use the following contingency routes:



Brest FIR

Unless instructed otherwise, flights entering the Brest FIR should use the following contingency routes:



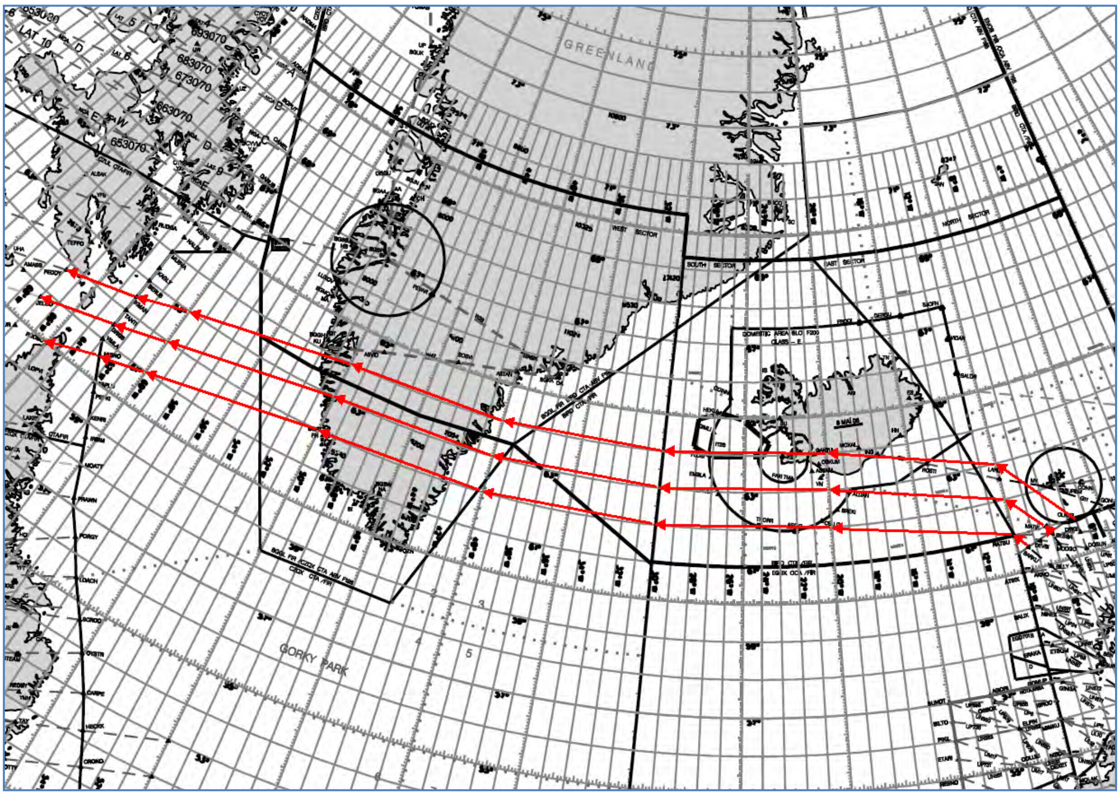
Reykjavik OCA/FIR

In limited- and no service contingency situations in Shanwick the following contingency tracks may be activated in Reykjavik OCA/FIR. Any NAT tracks that conflict with those contingency tracks would at the same time be cancelled. The contingency tracks must be flight planned as if they were random route tracks (detailing each waypoint in the flight plan).

OLKER – 63N010W – 64N020W – 64N030W – 64N040W – 64N050W – 63N060W – IKMAN – FEDDY

BESGA – MATIK – 62N010W – 63N020W – 63N030W – 63N040W – 63N050W – 62N060W – GRIBS – JELCO

BARKU – RATSU – 62N020W – 62N030W – 62N040W – 62N050W – 61N060W – MIBNO RODBO



1.8 LONG TERM CONTINGENCY ARRANGEMENTS

In the event that Shanwick loses the ability to provide an ATC service from the OACC at Prestwick for an extended period, contingency plans are in place to provide the service from an alternate location.

The facility will be established at another NATS location but will take some time to put in place as equipment and communication links have to be brought into operation and staff relocated. The nature of the loss of the Prestwick facility may influence the time required to bring the contingency facility into service, but it expected that under most circumstances an ATC service will be available in the Shanwick OCA within 48 hours. In the interim period no ATC service will be available and all flights will be required to route clear of the Shanwick OCA.

When established, the contingency facility will comprise a slightly reduced complement of control and support workstations, but with the existing range of communication facilities including VHF clearance delivery, OCL, ADS, CPPLC and AFTN.

Operators can expect that ATFM regulations will be in place throughout the period of the transition, with a gradual buildup to near normal operating levels. The facility is designed to meet 95% of demand and is sustainable in the long term.

Appendix A –

Gander procedures in event of Shanwick evacuation

Gander OAC shall endeavor to provide an ATC service throughout the Shanwick ACC as soon as evacuation commences.

Gander OAC will send a signal to all NAT track collective addresses advising of the Shanwick evacuation:

"EMERGENCY Evacuation of Shanwick Oceanic Control Centre is in progress. No IFR control will be provided by Shanwick. Gander OAC shall endeavor to monitor traffic within the Shanwick OAC. HF communication is unaffected. Instruct all flights to monitor VOLMET, emergency and air to air frequencies. Flights not in receipt of an oceanic clearance must land at an appropriate aerodrome, or request appropriate re-clearance to avoid Shanwick OCA. Flights within Shanwick OCA should contact the next agency as soon as possible. Refer to contingency documentation for advice"

Gander shall ensure and verify that information on all cleared aircraft proceeding eastbound from Gander's area, through Gander's Oceanic Airspace is passed to the next affected unit. The following telephone numbers may be used.

Area Control Centre	Telephone Number
Stavanger	+47 51 658042 +47 51 658048
Copenhagen	+453 248 1000
Amsterdam	+31 20 4062 197
Maastricht	+31 43 3661 283
London	North +44 1489 612414 West +44 1489 612413
Scottish (may also be subject to evacuation)	+44 1292 692763
Shannon	ATC WM/Ops Room +353 617 70700 Switchboard +353 614 72284

In coordination with Shanwick Aeradio, Gander may request that ADS flights log-on to CYQX in order to transmit automatic position reports and reduce frequency congestion.

Gander will co-ordinate with other Oceanic service providers (New York, Santa Maria, Reykjavik) to ensure that information on flights proceeding from their airspace directly into Shanwick OCA is coordinated with enroute agencies.

Appendix B –

Contact Details - Shanwick OACC

Shanwick Watch Supervisor	+44 1294 655141
ScOACC Watch Manager	+44 1292 692469
Shanwick ATC Sectors	+44 1294 655100
Shanwick Fax	+44 1292 692042
Ballygirreen (Shanwick Aeradio)	+353 61 368241 Ground/Air Ops +353 61 471199 Ground/Air Ops via Switchboard

Appendix C –

Evacuation Messages - Shanwick OACC

Gander OAC will send a signal to all NAT track collective addresses advising of the Shanwick evacuation:

"EMERGENCY Evacuation of Shanwick Oceanic Control Centre is in progress. No IFR control will be provided by Shanwick. Gander OAC shall endeavor to monitor traffic within the Shanwick OAC. HF communication is unaffected. Instruct all flights to monitor VOLMET, emergency and air to air frequencies. Flights not in receipt of an oceanic clearance must land at an appropriate aerodrome, or request appropriate re-clearance to avoid Shanwick OCA. Flights within Shanwick OCA should contact the next agency as soon as possible. Refer to contingency documentation for advice"

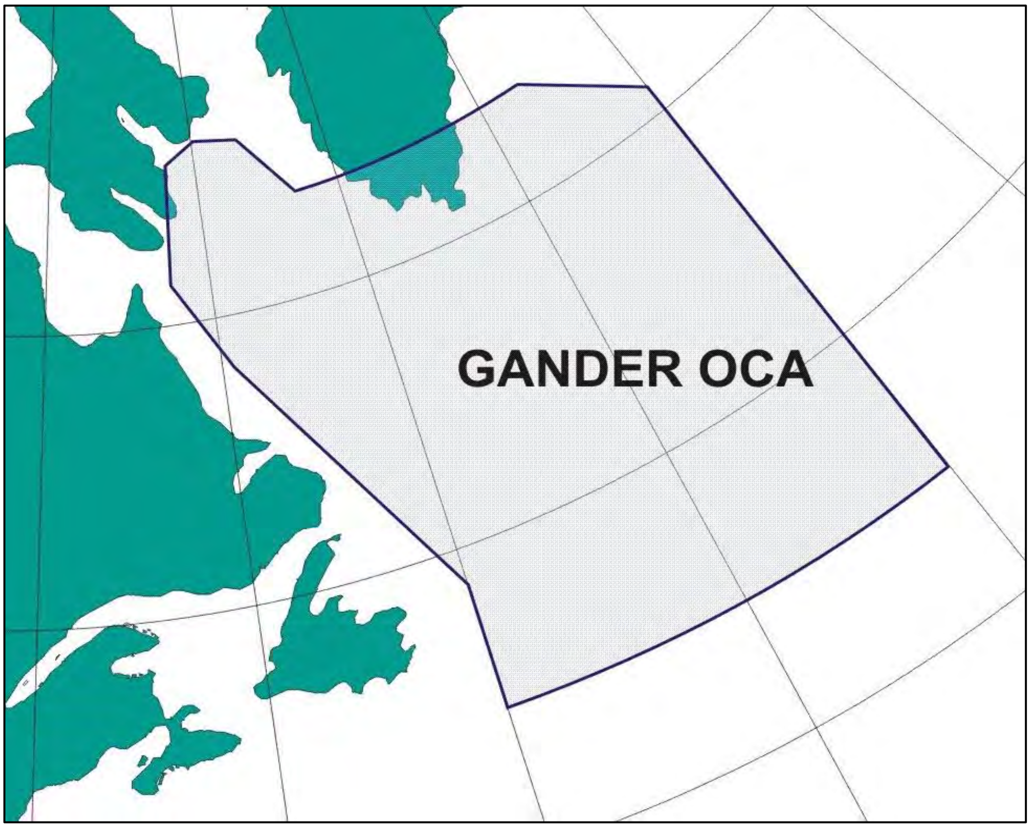
In addition Shanwick will issue the following NOTAM:

"Due to evacuation of the Prestwick Oceanic Area Control Centre, operations have been suspended. Contingency plans have been activated and a contingency service will commence shortly.
Oceanic clearance for westbound aircraft will not be issued until the commencement of a contingency service and adjacent ATS providers will not permit aircraft without an Oceanic clearance to enter the Shanwick OCA.
Aircraft operators are advised that the NMOC have implemented stringent ATFM plans for this airspace and slot tolerance is essential in order to obtain the maximum capacity from the contingency service.
Further information on the services available will be issued prior to the commencement of operations."

Shanwick Radio will broadcast the following message on HF VOLMET:

"Emergency evacuation of Shanwick OACC is in progress. No air traffic control service will be provided by Shanwick. Use extreme caution and monitor Shanwick Radio, emergency frequencies and air to air frequencies. Contact the next air traffic control unit as soon as possible".

CHAPTER 2: DETAILED PROCEDURES – GANDER OACC



2.1 FIR FOR WHICH THE CONTINGENCY PLAN APPLIES

Gander Oceanic FIR
Including ADS-B designated airspace over Greenland, see map Appendix E

2.2 FIRs WITH SUPPORTING PROCEDURES

Shanwick Oceanic FIR

Reykjavik Oceanic FIR

2.3 NOTIFICATION PROCEDURES

In a **limited service** situation notification of any service limitations and traffic management measures will be promulgated to operators and adjacent ANSPs via AFTN and through NAV CANADA National Operations Centre.

In a **no service** situation the OACC is likely to have been evacuated. As soon as possible after evacuation a contingency message will be sent to agencies which receive the NAT track message, detailed in Appendix A. In turn they are expected to advise the affected traffic.

2.4 LIMITED SERVICE - PROCEDURES

2.4.1 Disruption of ground/air communication capability

Communication services will be maintained using available equipment supplemented with the assistance of adjacent facilities. HF services on the North Atlantic ordinarily provided by CYQX International Flight Service Station will be delegated to the other International radio stations; New York AIRNC, Iceland Radio, Santa Maria Radio and Shannon Radio. Appropriate frequency will be published in the daily ATFM messages (NOTAM, Advisory)

VHF Frequencies used in ADS-B airspace over Greenland are included in Appendix F as reference information for adjacent units to use in contacting affected flights.

2.4.2 Disruption of ability to provide control services

Gander shall determine, co-ordinate and promulgate any necessary restrictions to meet the service limitation. Traffic in possession of a valid oceanic clearance shall have priority over any other traffic. Enroute reclearance of such traffic shall not be permitted except in emergency.

Traffic without a valid oceanic clearance may be subject to tactical traffic management measurements to meet the requirements of the service limitation.

Separation standards

Gander will be responsible for ensuring the co-ordination and implementation of any additional separation requirements.

ADS-B Airspace

Gander will be responsible for re-establishing procedural separation standards for aircraft within ADS-B airspace as practicable.

Contingency tracks

Dependant on the nature of the service limitation, Gander may promulgate and activate contingency tracks for use in addition to the OTS.

Air Traffic Flow Management

Gander shall co-ordinate any necessary traffic management measures where necessary with the NAV Canada National Operations Centre. Such measures may include, but are not limited to, temporary capacity restrictions and tactical rerouting measures.

Gander shall co-ordinate these restrictions where necessary with adjacent ANSPs where they may affect the flow of traffic through these units airspace.

Responsibilities of adjacent ANSPs

The action required of adjacent ANSPs will vary dependant on the nature of the service limitation. Where such action is not contained within the inter-centre Letters of Agreement (LOAs) the requirement will be promulgated within the initial failure and restrictions message.

2.5 NO SERVICE - PROCEDURES

2.5.1 Loss of ability to provide control services and ground/air communication capability

Gander ACC includes Gander Domestic Control and Gander Oceanic Control Units, and Gander International Flight Service Station (Gander Radio). Should Gander ACC be evacuated, the potential exist for a major disruption to Air Traffic Control (ATC) services extending from the western boundary of the Gander Flight Information Region (FIR) to 30 degrees west longitude

In the event Gander ACC is evacuated, an agreement between UK NATS and NAV Canada will have Shanwick Oceanic assume responsibility for the provision of Air Traffic Services (ATS) within the Gander OCA to the best of their ability, but will not normally issue re-clearances to aircraft within the Gander Oceanic CTA. Moncton and Montreal ACCs will assume responsibility for the provision of enroute ATS within the Gander FIR to the best of their abilities.

As soon as possible after evacuation a contingency message will be forwarded to all concerned agencies, either directly or through the NAV Canada National Operations Centre.

Until these contingency plans can be implemented, it is possible that the Gander Oceanic CTA may contain unexpected (non-OTS) traffic en-route to adjacent facility airspace. It is suggested that facilities adjacent to Gander take the following action:

- Increase or extend HF communication position report monitoring to include aircraft in Gander airspace;
- Pass traffic information on known Gander traffic to the next en-route facility after Gander; and:
- Prohibit profile changes (altitude and route) for aircraft exiting the Gander area until it can be safely assumed that there is no unknown traffic in that aircraft's vicinity.

All traffic en-route to transition Gander airspace without Gander approval shall be routed to remain clear of Gander airspace. **Exception:** Facilities responsible for loading a valid OTS commencing in their area of responsibility that transits the Gander OCA may elect to continue transitioning traffic in accordance with that track structure provided it is ensured that traffic information is passed to the next en-route facility after Gander.

2.6 FLIGHT CREW AND OPERATOR PROCEDURES

2.6.1 For flights within the Gander OCA – General

The procedures outlined below are to be used as guidance for pilots in the immediate aftermath of a sudden withdrawal of the ATC service as described above.

On receipt of the contingency message pilots are requested to broadcast to other flights on 121.5 and 123.45. A listening watch on these frequencies must be maintained.

When ADS-C equipped flights are notified of a Gander evacuation they must revert to voice position reporting until clear of Gander OCA, or notified otherwise. Pilots should note that they may be asked to log-on to an adjacent OACC when within the Gander OCA. Pilots should not initiate this action until instructed to do so.

Any flights involved in level changes should complete the maneuver as soon as possible in accordance with the clearance.

If unable to establish radio contact, flights may use any communication means necessary to provide position reports.

2.6.2 For flights within the Gander OCA – Westbound

Shanwick OACC will endeavor to provide an ATC service throughout the Gander OCA as soon as evacuation commences.

Flights should establish communication with the next agency at the earliest opportunity stating current position, cleared flight level, next position and estimate and subsequent position. This also applies to flights using automatic position reports (ADS/FMC) as these reports may not have been received by the next agency.

Oceanic Centre	Telephone Number	SATCOM Inmarsat Short Code
Reykjavik, via Iceland Radio	+354 568 4600	425105
Santa Maria	+351 296 820 438 +351 296 886 042 (satellite link)	426305
New York	+1 631 468 1413	436623
Ballygirreen (Shanwick Aeradio)	+353 61 368241 Ground/Air Ops +353 61 471199 Ground/Air Ops via Switchboard	425002

Flights may request their flight dispatch offices to forward position reports, if sending position reports to multiple ATS Units or if otherwise unable to forward position reports.

2.6.3 For flights within the Gander OCA – Eastbound

Shanwick OACC will endeavor to provide an ATC service throughout the Gander OCA as soon as evacuation commences.

Flights operating with a received and acknowledged oceanic clearance will be expected to continue in accordance with the last clearance issued unless otherwise advised by ATC.

Flights making automatic position reports are required to make voice position reports whilst within the Gander OCA, unless advised otherwise.

Communications with the next ATSU should be established at the earliest opportunity. Where no contact with the next agency can be established, Shanwick radio should be contacted on HF for advice.

2.6.4 For flights within the Gander Oceanic ADS-B airspace- eastbound and westbound

Shanwick OACC will endeavour to provide an ATC service throughout the Gander OCA as soon as evacuation commences.

Flights operating with a received and acknowledged oceanic clearance will be expected to continue in accordance with the last clearance issued unless otherwise advised by ATC.

Flights should establish communication with the next agency at the earliest opportunity stating current position, cleared flight level, next position and estimate and subsequent position. This also applies to flights using automatic position reports (ADS/FMC) as these reports may not have been received by the next agency.

Flights in contact with Gander via VHF frequencies located in Greenland should contact Shanwick OACC on published HF frequencies.

2.6.5 For flights approaching the Gander OCA when the contingency is activated

Not in Receipt of an Oceanic Clearance

In the event that Gander OACC must be evacuated, only aircraft with received and acknowledged oceanic clearances shall be permitted to transit Gander OCA.

If aircraft are unable to obtain or acknowledge an oceanic clearance, flights must plan to re-route around the Gander OCA or to land at an appropriate aerodrome. Request the appropriate re-clearance on the current frequency. Frequency congestion is likely.

In receipt of an acknowledged Oceanic Clearance

Aircraft operating with a received and acknowledged ocean clearance should proceed in accordance with the clearance. Flights should not request changes in altitude, speed or route except for reasons of flight safety or to comply with the oceanic clearance.

However, due to the uncertainty surrounding the contingency situation pilots are strongly advised to comply with the procedures detailed above for flights not in receipt of an oceanic clearance even if they are in receipt of an acknowledged Oceanic clearance.

Entering from another OCA

Flights within Reykjavik, New York or Santa Maria oceanic airspace, can anticipate a large re-route to avoid the Gander OCA and Gander FIR. Reykjavik and Santa Maria will issue advice on procedures to be followed

2.7 GANDER OACC – CONTINGENCY ROUTE STRUCTURE

i) In the event that Gander ACC must be evacuated, only aircraft with received and acknowledged oceanic clearances will be permitted to transit the Gander OCA.

ii) An Organized Track Structure (OTS) will remain valid for the time period published.

iii) If aircraft are unable to obtain or acknowledge an oceanic clearance, flights must plan to re-route around the Gander OCA or to land at an appropriate aerodrome. Request the appropriate re-clearance on the current frequency. Frequency congestion is likely.

iv) Based on where they exit oceanic airspace, westbound flights shall proceed in accordance with the following table, until communication is established with, and a re-clearance issued by the next agency.In the event that Gander ACC must be evacuated, only aircraft with received and acknowledged oceanic clearances will be permitted to transit the Gander OCA.

Note - the landfall fix is the fix after the oceanic exit point.

Ocean Exit	**Unless otherwise instructed proceed:**	**Next agency/frequency**
6500N06000W or AVPUT	NALDI DUTUM	Montreal ACC 132.800
6400N06000W or CLAVY	KAGLY TEFFO	Montreal ACC 132.800
6300N06000W or EMBOK	IKMAN FEDDY	Montreal ACC 132.800
6200N06000W or KETLA	GRIBS JELCO	Montreal ACC 134.800
6100N06000W or MAXAR	MIBNO RODBO	Montreal ACC 134.800
6000N06000W or PIDSO	PEPKI LOPVI	Montreal ACC 135.800
5900N06000W or SAVRY	LAKES	Montreal ACC 132.450
URTAK or MOATT	MOATT LOMTA TEALS VANSI	Montreal ACC 132.45
AVUTI or PRAWN	PRAWN YDP YKL ROUND	Montreal ACC 132.45
CUDDY or PORGY	PORGY HO YBC ANCER	Moncton ACC 132.95 or Montreal ACC 132.90 @ 63W
DORYY	BORUB YZV*	Moncton ACC 132.95 or Montreal ACC 132.90@ 63W
HOIST	YYR YRI*	Moncton ACC 132.52 or Montreal ACC 132.90 @ 63W
JANJO	QUBIS*	Moncton ACC 132.52 or Montreal ACC 132.90 @ 63W
LOMSI	TAFFY	Moncton ACC 132.52
NEEKO	MILLS	Moncton ACC 132.52
RIKAL	YAY DANOL	Moncton ACC 133.55
TUDEP	TOPPS	Moncton ACC 133.55
ALLRY	EBONY	Moncton ACC 132.75
ELSIR	ALLEX	Moncton ACC 132.75
JOOPY	TUSKY	Moncton ACC 132.75
NICSO	YYT BRADD	Moncton ACC 125.25
PORTI	KANNI	Moncton ACC 125.25
SUPRY	WHALE	Moncton ACC 125.25
VODOR	RAFIN NANSO VITOL*	Moncton ACC 125.25
BOBTU	JAROM LOMPI DOVEY*	Moncton ACC 125.25
* *Aircraft may not be able to contact next control agency until established on this route*		

v) Eastbound Aircraft operating with a received and acknowledged ocean clearance should proceed in accordance with the clearance. Flights should not request changes in altitude, speed or route except for reasons of flight safety or to comply with the oceanic clearance.

vi) The Eastbound Organized Track System will be extended to begin at fixes on or near the western boundary between the Gander FIR and the Moncton and Montreal FIR's.

vii) Based on the Oceanic Entry Point, eastbound flights shall proceed in accordance with the following table, until communication is established with, and a re-clearance issued by the next agency.

***Aircraft north of MOATT continue on oceanic clearance as received from YUL ACC.**		
FIR boundary fix	Landfall fix	Oceanic Entry Point in OTS message
KENKI		AVPUT
MUSVA		CLAVY
BERUS		EMBOK
GRIBS		KETLA
MIBNO		MAXAR
PEPKI		PIDSO
LAKES	5900N06000W	SAVRY
YKL	LOMTA	MOATT or URTAK
YWK	YDP	PRAWN or AVUTI
MUNBO	HO	PORGY or CUDDY
BORUB		DORYY
TASTI	YYR	HOIST
SERBO		JANJO
VERTU		LOMSI
PIKNA		NEEKO
NAPLO	YAY	RIKAL
MIGLI		TUDEP
LOPRO		ALLRY
VINSI	YQX	ELSIR
TAGRA		JOOPY
SUTKO	YYT	NNICSO
RUBDA		PORTI
PEPRA		SUPRY
NANSO	RAFIN	VODOR
LOMPI	JAROM	TALGO

2.8 LONG TERM CONTINGENCY ARRANGEMENTS

Until full service can be re-established, Gander ACC will delegate the control of aircraft within the Gander Oceanic Control Area to Shanwick Oceanic. Level 2 of NAV Canada's Oceanic recovery will have Gander establish a Planning/Coordination Centre. This Planning/Coordination Centre will maintain responsibility for planning of all eastbound flights, and coordination of eastbound and westbound flights with NAV Canada Domestic Facilities. Gander will coordinate all eastbound flights that penetrate New York Oceanic Control Area directly from Gander Domestic Airspace. The provision of ADS-B services in Gander OACC ADS-B airspace will remain suspended until such time as full service can be re-established.

The Facility recovery Document and Business Resumption plan for Gander Area Control Centre is broken down into a 5 step process.

Level 1: *Emergency Services*

Control service to EMERGENCY and HUMANITARIAN Flights, along with limited Airspace Reservations (no aircraft joining or departing).

Level 2: *Single Stand Operation*

Emergency and Humanitarian flights, along with limited Airspace Reservations (no aircraft joining or departing) would take priority. Control service provided through minimum staff with limited equipment. This would result in a metered flow through the Gander Oceanic Area, of commercial, general aviation, military and state aircraft.

Level 3: *Capacity Limited, Normal Control Service*

Emergency and Humanitarian flights, along with limited Airspace Reservations (no aircraft joining or departing) would take priority. Control service with accompanying clearance delivery communication would be offered through an increased number of operating positions. Flow restrictions and metering would be established to reduce congestion.

Level 4: *Normal Control Service*

Provide control service using the Planning/Coordination Centre. All required communication will be available. The Gander Planning/Coordination Centre would provide the full range of services required by eastbound aircraft, and act as the coordinator between Shanwick Oceanic and NAV Canada domestic facilities. Control of Gander's Oceanic Area would be maintained by Shanwick.

Level 5: *Total Restoration of Services by Gander Oceanic*

Full Oceanic enroute and planning services restored to a NAV Canada facility and provided by Gander Oceanic control staff. Control of Gander Oceanic Area would be returned to NAV Canada by Shanwick. ADS-B services resume once control of Gander Oceanic Airspace is returned to NAV Canada by Shanwick.

2.9 DATA LINK SYSTEM FAILURE

2.9.1 Gander OACC Procedures

In the event of an unexpected data link shutdown, Gander shall inform:

a. All currently connected FANS-1/A equipped aircraft via voice.

b. The adjacent ANSPs by direct coordination; and

c. All relevant parties via the publication of a NOTAM, if appropriate

d. Aircraft using separations standards requiring FANS1/A shall be transitioned to non FANS oceanic standards

2.9.2 Pilot Procedures

Pilots shall terminate the data link connection and use voice until further informed by Gander that the data link system has resumed normal operations.

Appendix A –

Shanwick procedures in event of Gander evacuation

Shanwick Oceanic will endeavor to provide an ATC service throughout the Gander OCA as soon as evacuation commences.

Shanwick will ensure and verify that information on all cleared aircraft proceeding westbound from Shanwick's area, through Gander's Oceanic Airspace is passed to the next affected unit.

Moncton	Telephone 506-867-7173 or 7175
Montreal	Telephone 514-633-3365 or 3278
Edmonton	Telephone 780-890-8397 or 8306

Shanwick will co-ordinate with other Oceanic service providers (New York, Santa Maria, Reykjavik) to ensure that information on flights proceeding from their airspace directly into Gander OCA is coordinated with enroute agencies.

Appendix B –

Contact Details - Gander OACC

Gander Shift Manager	+1 709 651 5207 +1 709 651 5203
Gander Oceanic	+1 709 651 5324
Gander Control Tower	+1 709 651 5329
Gander Airport Duty Manager	+1 709 424 1235
NAV Canada Operations Centre	+1 613 563 5626
Moncton ACC	+1 506 867 7173
Montreal ACC	+1 514 633 3365

Appendix C –

Evacuation Messages - Gander OACC

"Emergency evacuation of Gander Centre and Gander Radio in progress. No IFR control or HF communication service will be provided by Gander, I repeat, no IFR Control or HF communication service will be provided by Gander. Use extreme caution and monitor this frequency, emergency frequencies and air to air frequencies. Westbound flights west of 50 west contact Moncton Centre or Montréal Centre as soon as possible. Eastbound flights west of 50 west not in receipt of an oceanic clearance must land at an appropriate aerodrome, or request appropriate re-clearance to avoid Gander OCA/FIR. All other flights contact Shanwick radio, New York ARINC, Søndrestrøm FIC, Iceland Radio or Santa Maria Radio as soon as possible. Please broadcast this information on 123.45, 121.5 and 243.0"

Appendix D –

Gander International Flight Service Station Procedures

in Event of a Data Link System Failure

A. The communications service provider (CSP) will advise participating airlines and the OACC if there is a widespread ADS Failure

B. The CSP will provide the OACC with a list of all aircraft that were logged on to the NAV Canada Gateway.

C. The OACC will provide the list to IFSS including the last WPR received

D. IFSS will prioritise the list and retrieve associated SELCAL

E. IFSS will advise aircraft that limited data link capabilities may result in voice WPR

NOTES

1. One NOTAM may be issued for all participating OACCs if there is a widespread ADS Suspension. In event that the failure is localized, Gander OACC may suspend ADS-WPR in Gander's FIR. Resumption of ADS WPR will be at the discretion of the ACC Shift manager/Oceanic Supervisor.

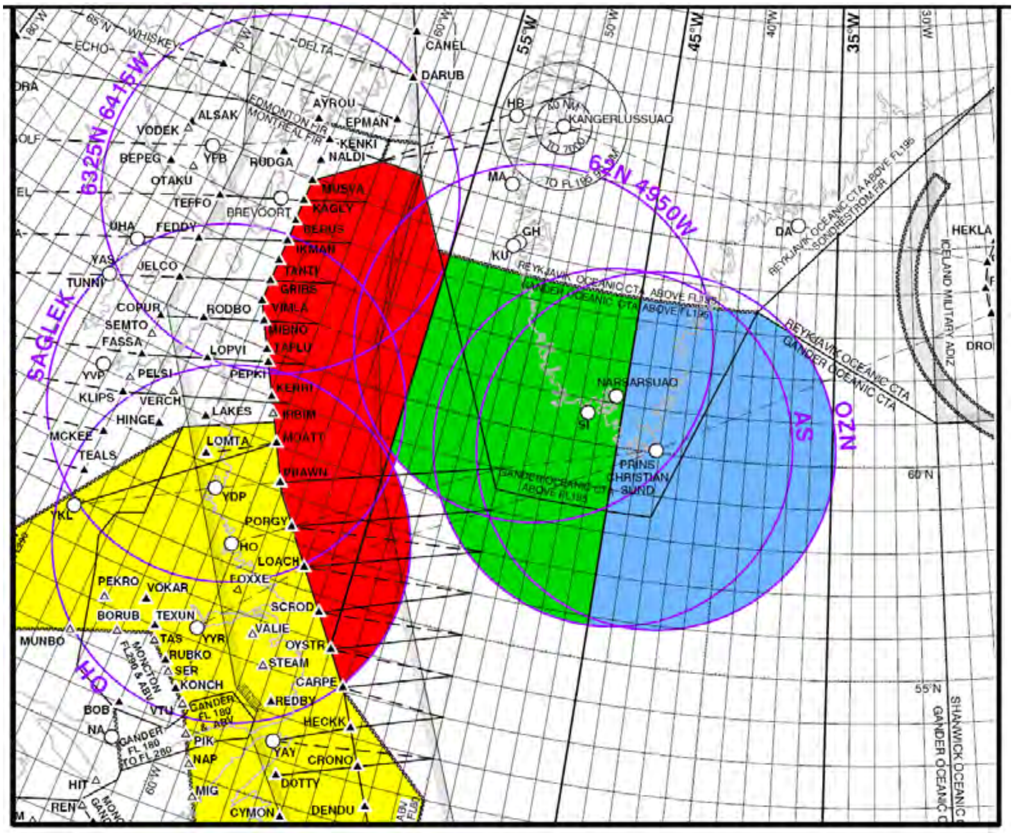
2. The CSP will issue e-mail bulletins to users, including NAV Canada, advising of the outages and including any available extent/duration information.

3. Gander radio will SELCAL flights to advise of the failure, as per the North Atlantic Region Data Link Initiative.

Appendix E –

ADS-B airspace MAP

ICAO airspace delegated to Canada generally falling within an area west of 35 degrees longitude and north of 56 degrees latitude. ADS-B services will be available at FL290 and above.



Appendix F –

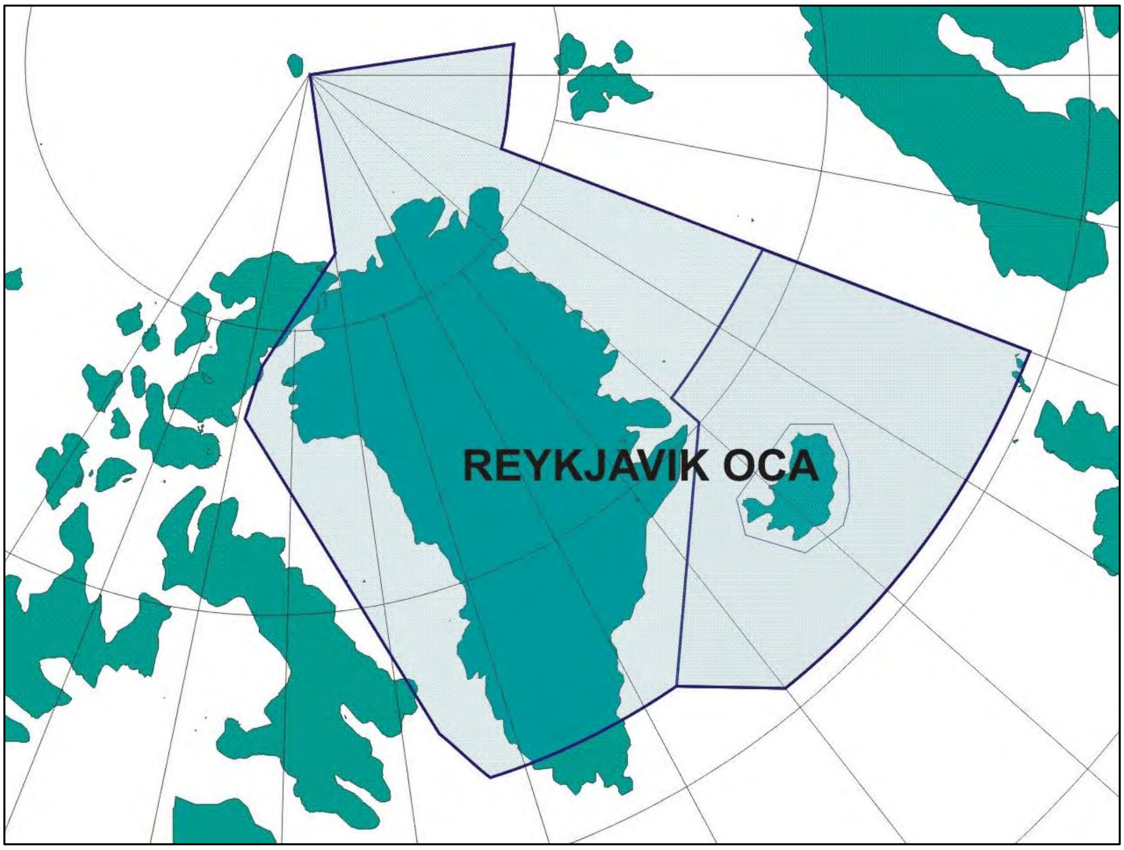
Communications and Position Reporting Procedures in NAT MNPS ADS-B Airspace

VHF Frequencies (see attached table) to provide DCPC for ADS-B coverage area within the Gander OCA will be located at:

- Brevoort, Canada
- Saglek, Canada
- Hopedale, Canada
- Paamiut, Greenland
- Frederiksdal, Greenland
- Prince Christian Sund, Greenland
- Simiutaq, Greenland

Site	Designator	Power (W)	Frequency	VSCS Name	Radio No.
Saglek	SV	300	135.325	**135.32 SV**	**96**
Saglek	SV	50	123.75	**123.75 SV**	**79**
Breevort	BZ	50	128.075	**128.07 BZ**	**104**
Breevort	BZ	50	124.825	**124.82 BZ**	**95**
Hopedale	HO	300	132.65	**132.65 HO**	**80**
Paamiut	PA	50	135.15	**135.15 PA**	**97**
Paamiut	PA	50	132.375	**132.37 PA**	**98**
Paamiut	PA	50	127.55	**127.55 PA**	**89**
Simiutaq	SM	50	134.475	**134.47 SM**	**99**
Simiutaq	SM	50	132.85	**132.85 SM**	**100**
Simiutaq	SM	300	126.825	**126.82 SM**	**90**
Simiutaq	SM	50	120.7	**120.7 SM**	**91**
Frederiksdal	FD	300	135.675	**135.67 FD**	**101**
Frederiksdal	FD	50	119.8	**119.8 FD**	**102**
Frederiksdal	FD	50	118.425	**118.42 FD**	**92**
Prins Christian Sund	PC	50	134.95	**134.95 PC**	**103**
Prins Christian Sund	PC	50	133.05	**133.05 PC**	**93**
Prins Christian Sund	PC	50	124.0	**124.0 PC**	**94**

CHAPTER 3: DETAILED PROCEDURES – REYKJAVIK OACC



3.1 FIR FOR WHICH THE CONTINGENCY PLAN APPLIES

Reykjavik Oceanic FIR/CTA

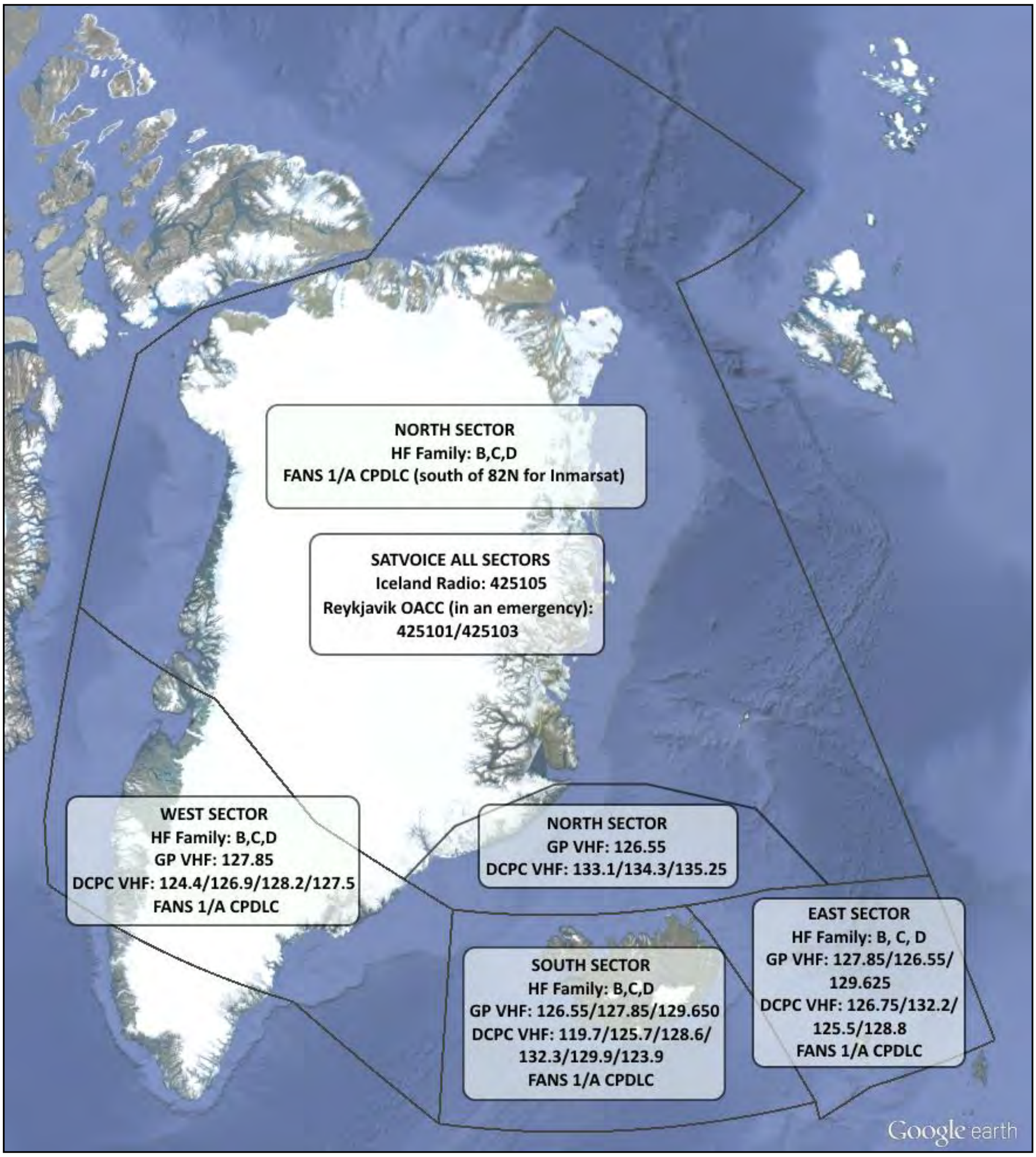


Figure: Reykjavik CTA sectorization and communication possibilities
(VHF frequencies are listed in order of priority)

3.2 FIRs WITH SUPPORTING PROCEDURES

None

3.3 NOTIFICATION PROCEDURES

In a **limited service** situation, notification of any service limitations and traffic management measures will be promulgated to operators and adjacent ANSPs by NOTAM normally not later than 12 hours prior to activation or as soon as practicable in case of an unexpected service interruption.

In a **no service** situation, the OACC is likely to have been evacuated. As soon as possible after evacuation a contingency message will be sent by NOTAM and Iceland radio will advise aircraft within Reykjavik FIR/CTA. Adjacent centres will be advised by phone.

3.4 LIMITED SERVICE - PROCEDURES

3.4.1 Disruption of ground/air communication capability

Iceland Radio and Shanwick Radio jointly provide voice communications in the Reykjavik and Shanwick Oceanic Control Areas.

Radio Operators work flights in either area on an as-needed basis, serving both Reykjavik and Shanwick Control Centres.

Joint Operations between Iceland Radio and Shanwick Radio enhance redundancy in the provision of the general purpose voice communications service.

Iceland radio provides communication services using HF and general purpose VHF. Reykjavik OACC provides DCPC VHF communications in the South sector, East sector, West sector and the southernmost part of North sector. Reykjavik OACC and Iceland radio are located in separate buildings several kilometers apart. Disruption at one facility is therefore unlikely to affect the other and each will therefore serve as a backup for the other in cases of limited disruption of ground/air communication capability.

In case of failure of Iceland radio HF services, the HF service will be delegated to Gander Radio and Bodø Radio.

3.4.2 Disruption of ability to provide control services

Reykjavik will determine, co-ordinate and promulgate any necessary restrictions to meet the service limitation. Traffic in possession of a valid oceanic clearance will have priority over any other traffic. Enroute re-clearance of such traffic will not be permitted except in emergency.

Traffic without a valid oceanic clearance may be subject to tactical traffic management measurements to meet the requirements of the service limitation.

Flight planning

Flight plans shall be filed and addressed to Reykjavik Oceanic Area Control Centre as well as to the appropriate adjacent ATS Units and IFPS, where applicable, in accordance with normal procedures (see AIP Iceland ENR 1.11).

Separation standards

Reykjavik will be responsible for ensuring the co-ordination and implementation of any additional separation requirements. In case of contingency track activation, there shall be at least 20 minutes separation between aircraft upon entry on the same contingency track and level (see chapter 3.7 for contingency route structure).

Contingency tracks

Dependant on the nature of the service limitation, Reykjavik may promulgate and activate contingency tracks for use in addition to the NAT OTS. The contingency route structure detailed in this section will in most cases be implemented.

Air Traffic Flow Management

Reykjavik will co-ordinate any necessary traffic management measures where necessary with the NMOC. Such measures may include, but are not limited to, temporary capacity restrictions and tactical re-routeing measures.

Reykjavik will co-ordinate these restrictions where necessary with adjacent ANSPs where they may affect the flow of traffic through these units airspace.

Communications

Aircraft shall not communicate directly with Reykjavik Oceanic Control on DCPC VHF except when instructed to do so or if in emergency. Position reporting within Reykjavik CTA will be with Iceland Radio or via ADS-C in accordance with normal procedures. Aircraft unable to contact Iceland Radio on HF Frequency shall call either Bodø Radio or Gander Radio.

Aircraft shall maintain continuous listening watch on the assigned frequencies.

ATS surveillance service

An ATS surveillance service will be provided at ATS discretion. Aircraft are required to maintain their assigned discrete SSR Code while within Reykjavik FIR/CTA. West of 030W the ATS surveillance service is provided with ADS-B only.

Responsibilities of adjacent ANSPs

The action required of adjacent ANSPs will vary dependant on the nature of the service limitation. Where such action is not contained within the inter-centre Letters of Agreement (LOAs) the requirement will be promulgated within the initial failure and restrictions message.

3.5 NO SERVICE - PROCEDURES

3.5.1 Loss of ground/air communication capability

Iceland Radio and Shanwick Radio jointly provide voice communications in Reykjavik and Shanwick Oceanic Control Areas.

Radio Operators work flights in either area, updating both Reykjavik and Shanwick Control Centres.

Joint Operations between Iceland Radio and Shanwick Radio increases the ability to provide a 'normal' service with assistance from adjacent aeronautical stations.

Iceland Radio provides communication services using HF and general purpose VHF. Reykjavik OACC provides DCPC VHF communications in the South sector, East sector, West sector and the southern most part of North sector. Reykjavik OACC and Iceland Radio are in separate buildings located several kilometers apart. Disruption at one facility is therefore unlikely to affect the other facility and each will therefore serve as a backup for the other in cases of limited disruption of ground/air communication capability.

In case of failure of Iceland radio HF services, the HF service will be delegated to Gander Radio and Bodø Radio.

3.5.2 Loss of ability to provide control services

Should Reykjavik OACC be evacuated the potential exists for a major disruption to Air Traffic Control service within the Reykjavik OCA.

The HF and general purpose VHF radio communications facilities for the Reykjavik Oceanic Centre are remotely located at the Iceland radio facilities in another part of Reykjavik city, and will therefore unlikely be affected.

In the event that Reykjavik ATCC is evacuated, the operations will be moved to Iceland radio and the provision of Air Traffic Services (ATS) within the Reykjavik FIR/OCA will be continued at that location as far as practicable.

As soon as possible after evacuation a contingency message will be sent by NOTAM and Iceland Radio will advise aircraft within Reykjavik FIR/CTA. Adjacent centers will be advised by phone.

Contact information that may be used in the event of an emergency evacuation is provided in Appendix B.

Flight planning

Flight plans shall be filed and addressed to Reykjavik Oceanic Area Control as well as to the appropriate adjacent ATS Units and IFPS, where applicable, in accordance with normal procedures.

Separation standards

Reykjavik will be responsible for ensuring the co-ordination and implementation of any additional separation requirements. In case of contingency track activation, there shall be at least 20 minutes separation between aircraft upon entry on the same contingency track and level.

Contingency tracks

The contingency route structure detailed in this section will be implemented.

Air Traffic Flow Management

Reykjavik will co-ordinate any necessary traffic management measures where necessary with the NMOC. Such measures may include, but are not limited to, complete closure of the airspace, temporary capacity restrictions and tactical re-routeing measures.

Reykjavik will co-ordinate these restrictions where necessary with adjacent ANSPs where they may affect the flow of traffic through these units airspace.

Communications

HF congestion is likely. Communications should be kept to a necessary minimum. Unnecessary routeing-, flight level- and speed changes will not be issued.

Communications and Position reporting within Reykjavik FIR/CTA will be with Iceland Radio or via ADS-C. Aircraft unable to contact Iceland Radio on general purpose VHF or HF Frequency shall call either Gander Radio or Bodø Radio. Aircraft shall maintain continuous listening watch on the assigned frequencies.

ATS surveillance service

An ATS surveillance service will not be provided. Aircraft are nevertheless required to maintain their assigned discrete SSR Code while within Reykjavik FIR/CTA.

Responsibilities of adjacent ANSPs

Other ATSUs will provide guidance as far as possible in the circumstances.

3.6 FLIGHT CREW AND OPERATOR PROCEDURES

3.6.1 For flights within the Reykjavik OCA

The procedures outlined below are to be used as guidance for pilots in the immediate aftermath of a sudden withdrawal of the ATC service as described above.

On receipt of the contingency message pilots are requested to broadcast to other flights on 121.5 and 123.45. A listening watch on these frequencies must be maintained.

Reykjavik OACC will endeavor to provide a limited ATC service through Iceland radio as soon as possible after evacuation commences.

Flights operating with a received and acknowledged oceanic clearance will be expected to continue in accordance with the last clearance issued unless otherwise advised by ATC. Aircrew shall use extreme caution and use all available means to detect any conflicting traffic.

Flights should remain in/establish communications with Iceland Radio. Flights unable to contact Iceland Radio should establish communication with the next agency at the earliest opportunity stating current position, cleared flight level, next position and estimate and subsequent position. This also applies to flights using automatic position reports (ADS-C) as these reports may not have been received by the next agency.

When flights making automatic position reports are notified of a Reykjavik evacuation they must revert to voice position reporting until clear of Reykjavik OCA, or notified otherwise. Pilots of FANS1/A equipped flights should note that they may be asked to log-on to the next agency while within the Reykjavik OCA, they should not initiate this action until instructed to do so.

If unable to establish radio contact, flights may use SATCOM voice or satellite telephone to provide position reports.

Oceanic Centre	Telephone Number	SATCOM Inmarsat Short Code
Gander	+1 709 651 5207	431613
Santa Maria	+351 296 820 438 +351 296 886 042 (satellite link)	426305
New York	+1 631 468 1413	436623
Ballygirreen (Shanwick Aeradio)	+353 61 471 199	425002
Reykjavik, via Iceland Radio	+354 568 4600	425105

Flights may request their flight dispatch offices to forward position reports, if sending position reports to multiple ATS Units or if otherwise unable to forward position reports.

3.6.2 For flights approaching the Reykjavik OCA when the contingency is activated

Not in Receipt of an Oceanic Clearance

In the event that Reykjavik OACC must be evacuated, only aircraft with received and acknowledged oceanic clearances are permitted to enter Reykjavik OCA.

If unable to obtain or acknowledge an oceanic clearance, flights shall re-route around the Reykjavik OCA or land at an appropriate airfield. The adjacent areas will issue advice on procedures to be followed.

In receipt of an acknowledged Oceanic Clearance

Aircraft operating with a received and acknowledged oceanic clearance can, at pilot's discretion, continue, but must expect a limited ATC service within the Reykjavik OCA. Aircrew shall use extreme caution and use all available means to detect any conflicting traffic. HF communications will be available through Iceland radio.

However, due to the uncertainty surrounding the contingency situation pilots are strongly advised to comply with the procedures detailed above for flights not in receipt of an oceanic clearance even if they are in receipt of an acknowledged Oceanic clearance.

3.7 REYKJAVIK OACC – CONTINGENCY ROUTE STRUCTURE

3.7.1 For activation within Reykjavik OCA

In a **limited service** contingency situation Reykjavik OACC may promulgate contingency tracks in addition to the published OTS. A set of routes, titled ICECON Tracks, have been established for this purpose. Promulgation of the tracks will be via AFTN.

It is mandatory to flight plan on the ICECON tracks during the periods detailed below. The contingency tracks must be flight planned as if they were random route tracks (detailing each waypoint in the flight plan).

IT IS ESSENTIAL FOR AVIATION SAFETY THAT ALL PILOTS UNDERSTAND AND COMPLY WITH THE PROVISIONS OF THIS CONTINGENCY PLAN.

Flight level changes for en-route aircraft should not be expected within Reykjavik CTA.

Random flights at directional levels will be accepted at FL 290 and below as well as FL 410 and above, however, flow restrictions may be imposed.

An ATS Surveillance service will be provided at ATS discretion.

Ambulance and SAR flights will be dealt with on individual bases.

Day Tracks

The following DAY TRACKS will be effective on entry into Reykjavik FIR/CTA from 0930 to 1800 except A, B and C, which will be activated as part of the NAT OTS.

A	BARKU - RATSU - 63N020W - 64N030W - 64N040W - 63N050W - LIBOR Westbound FL340/350/360 Eastbound FL380
B	ATSIX - 62N020W - 63N030W - 63N040W - 62N050W - PIDSO Westbound FL340/350/360/370/380/390 Eastbound NIL
C	BALIX - 61N020W - 62N030W - 62N040W -61N050W – SAVRY Westbound FL340/350/360/370/380/390 Eastbound NIL
ICECON 8	BESGA - MATIK - 62N010W - 64N020W - 66N030W - 67N040W - 67N050W - DARUB Westbound FL340/350/360 Eastbound FL390
ICECON 10	OSBON - 63N010W - 65N020W - 67N030W - 69N040W - 70N050W - 70N060W - ADSAM Westbound FL340/350/360 Eastbound FL370/380/390
ICECON 14	SOSAR - 66N005W - 71N010W - 7630N020W - 81N040W - ALERT Westbound FL340/350/360 Eastbound NIL
ICECON 16	73N00W - 79N010W – 82N020W - PELRI Westbound FL340/350/360 Eastbound FL310
ICECON 18	80N00W - 85N020W - OVBES Westbound FL340/350/360 Eastbound FL310
ICECON 20	76N000W - 78N020W - 7830N040W - THT - LENIM Westbound FL320/330 Eastbound FL370/380
ICECON 22	IPTON - 63N010W - 63N020W - 64N030W - 64N040W - 63N050W - LIBOR Westbound FL330 Eastbound NIL
ICECON 24	GUNPA - 62N010W - 62N020W - 63N030W - 63N040W - 62N050W - PIDSO Westbound FL330 Eastbound NIL
ICECON 24A	GUNPA - 62N010W - 62N020W - 62N030W - 62N040W - 61N050W – SAVRY Westbound FL330 Eastbound NIL

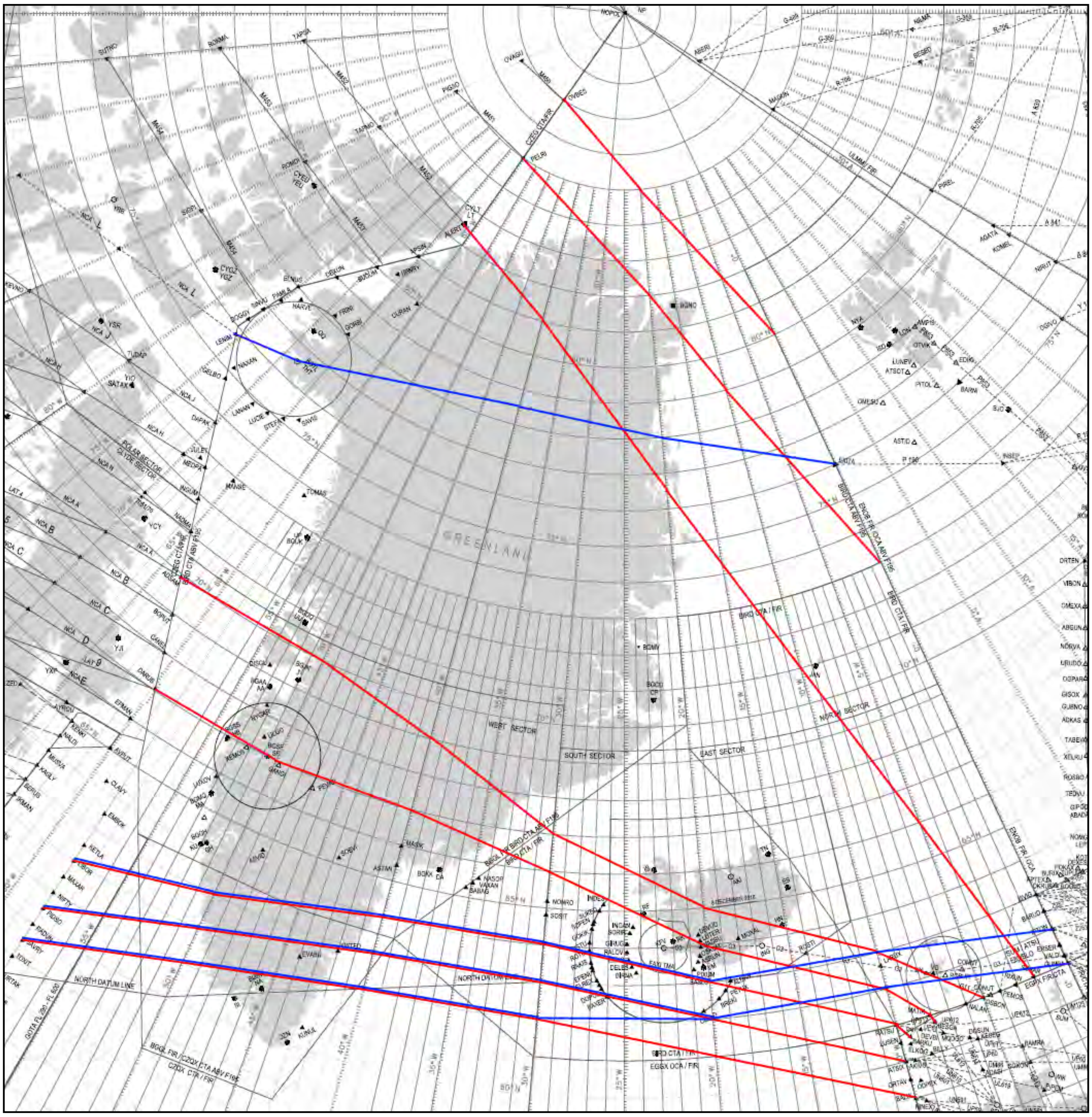


Figure: Contingency day tracks effective on entry into Reykjavik FIR/CTA from 0930 to 1800 except A, B and C, which will be activated as part of the NAT OTS.
Refer to the text above for flight level allocation on the tracks.

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 - OSBON
Eastbound FL340/350
Westbound FL330

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

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

ICECON 13 61N040W - 62N030W - 62N020W - 62N010W - GUNPA
Eastbound FL360/370/380
Westbound NIL

ICECON 13A 61N040W - 62N030W - 62N020W - RATSU - BARKU
Eastbound FL360/370/380
Westbound NIL

ICECON 15 ALERT- 81N040W - 7630N020W - 71N010W - 66N005W - SOSAR
Eastbound FL350/390
Westbound FL340

ICECON 17 PELRI - 82N020W - 79N010W – 73N000W
Eastbound FL350/360/370
Westbound FL310/340

ICECON 19 OVBES - 85N020W – 80N000W
Eastbound FL350/360/370
Westbound FL310/340

ICECON 21 LENIM - THT - 7830N040W - 78N020W – 76N000W
Eastbound FL330/380
Westbound FL320

Eastbound traffic will not be permitted to route from Shanwick or Scottish airspace into Reykjavik airspace unless at FL 270 and below or FL 390 and above.

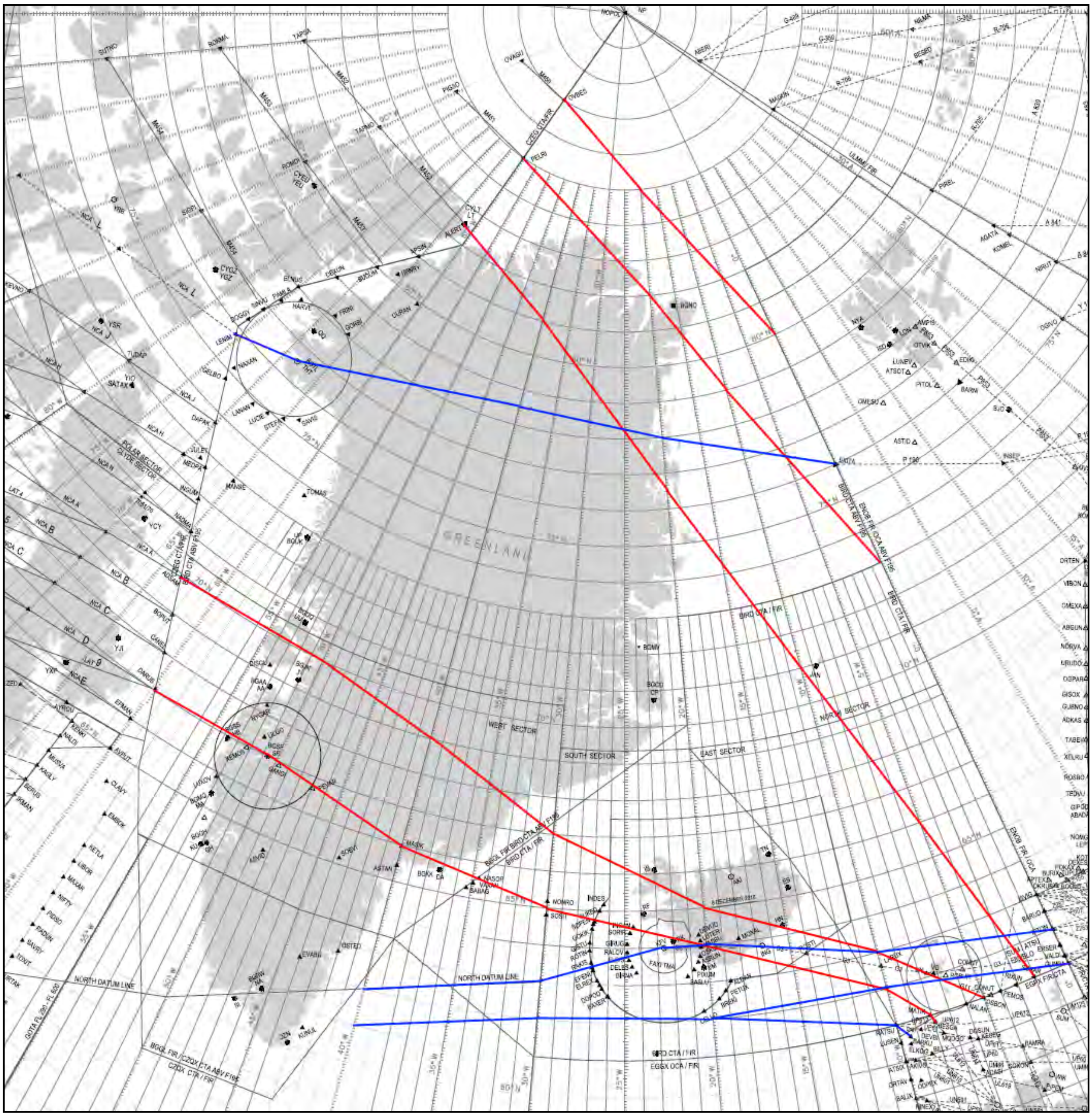


Figure: Contingency night tracks effective on entry into Reykjavik FIR/CTA from 2300 to 0600 except ICECON 11 and 13 which will become effective from 0100 until 0600 at 30W. Refer to the text above for flight level allocation on the tracks.

Tracks available 24 hours

Iceland - inbound and outbound

INBOUND

RATSU - ALDAN - ASRUN - KFV
Westbound FL320

GUNPA - 63N010W - ING - NASBU - KFV
Westbound FL 310

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

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

OUTBOUND

BIKF - PIXUM PETUX - RATSU - BARKU
Eastbound FL 310

BIKF - OSKUM - 63N010W - GUNPA

Eastbound FL 320

BIKF - RALOV - RAKIS - 63N030W - 62N040W
Westbound FL 320

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

Faeroes Islands - inbound and outbound

INBOUND

VALDI - ROBUR
Westbound FL 280

OUTBOUND

G11 - PEMOS
Eastbound FL 290

Søndrestrøm - inbound and outbound

INBOUND

ICECON 12 IPTON - 64N010W - 66N020W - 67N030W - 67N040W - 67N050W - SF
Westbound FL 310

EPMAN - SF
Eastbound FL 300

MAXAR - KU - SF
Northbound FL 320

SAVIS - TOMAS - UP - DISGU - SF
Southbound FL 320

OUTBOUND

ICECON 12 67N050W - 67N040W - 67N030W - 66N020W - 64N010W - IPTON
Eastbound FL 320

EPMAN
Westbound FL 320

KU - MAXAR
Southbound FL 310

DISGU - UP - TOMAS - SAVIS - THT
Northbound FL 310

An ATS Surveillance service will be provided by ATC Søndrestrøm.

Thule - inbound and outbound

INBOUND

DISGU - UP - TOMAS - SAVIS - THT
Northbound FL 310

JULET - LANAN - THT
ALL LEVELS to LANAN, after LANAN FL290 at or below

OUTBOUND

SAVIS - TOMAS - UP - DISGU - SF
Southbound FL 320, not ABV FL 310 until after SAVIS

LANAN - JULET
ALL LEVELS, not ABV FL 310 until after LANAN

Radar service will be provided by Thule-TRACAB.

Traffic via Murmansk

CANEL 73N060W 79N055W 84N040W ABERI
Eastbound FL300
Westbound NIL

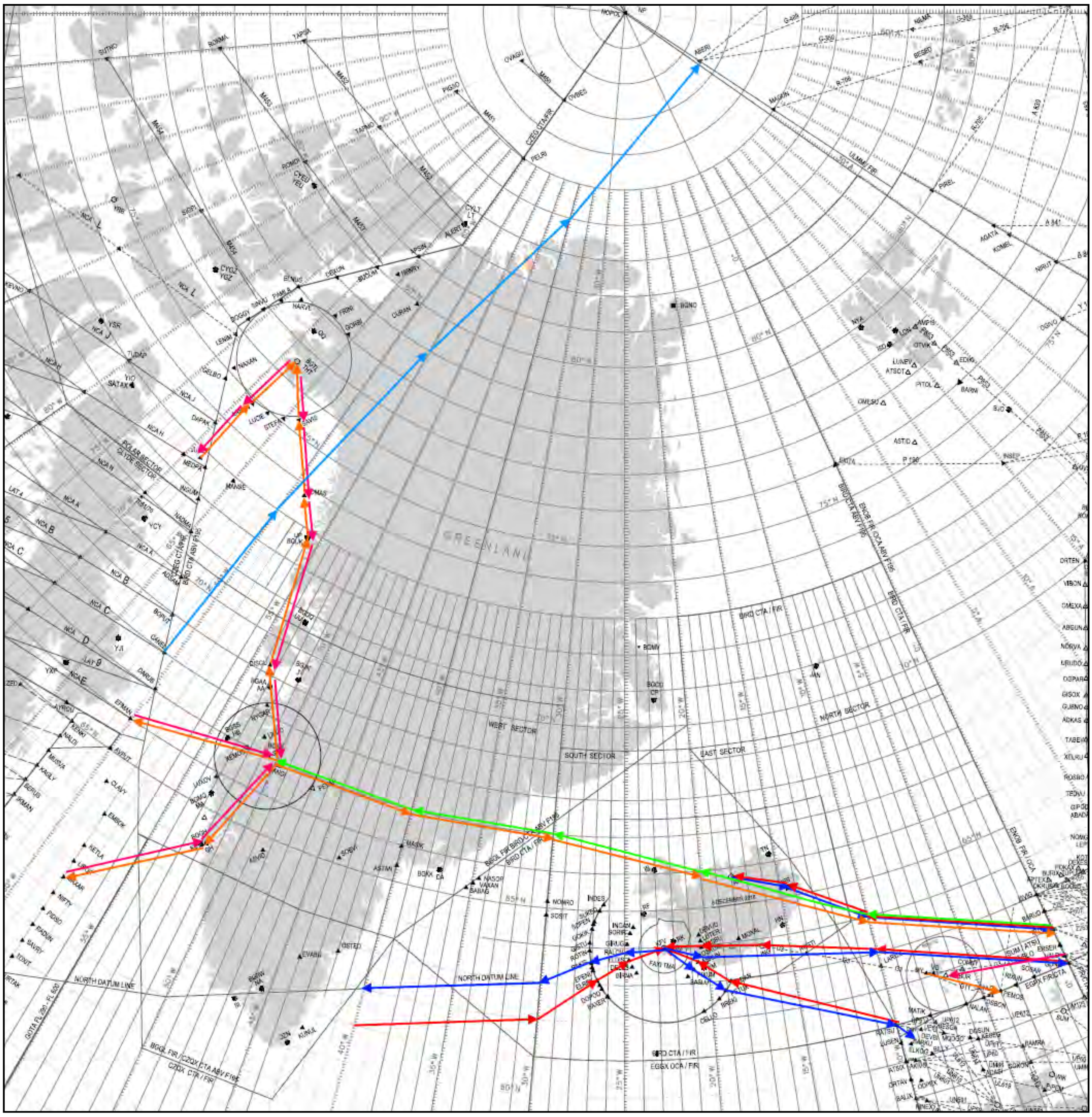


Figure: Contingency tracks available 24 hours.
Refer to the text above for flight level allocation on the tracks.

3.8 LONG TERM CONTINGENCY ARRANGEMENTS

In development.

Appendix A –

Procedures by Adjacent Areas in Event of Reykjavik Evacuation

NONE

Appendix B –

Contact Details - Reykjavik OACC

Reykjavik OACC		
Reykjavik Shift Manager (07:00-23:00)	+354 424 4343	acc@isavia.is
Reykjavik Shift Manager Iridium Satellite Phone (07:00-23:00)	+881 631 450 347	
Shift Manager (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	
ATM Systems Department	+354 424 4328	
ATM Systems Department, Mobile	+354 897 8483	
Manager Reykjavik OACC Ms. Þórdís Sigurðardóttir	+354 424 5140 +354 699 8504 (mobile)	thordis.sigurdardottir@isavia.is
Deputy Manager Reykjavik OACC Mr. Árni Baldursson	+354 424 5141 +354 615 2565 (mobile)	arni.baldursson@isavia.is
Senior ATM expert Mr. Sigurleifur Kristjánsson	+354 424 5106 +354 897 0336 (mobile)	sigurleifur.kristjansson@isavia.is
Supervisor Iceland Radio	+354 424 4100	supervisor.iceland.radio@isavia.is
Radio operator Iceland Radio	+354 568 4600	

Appendix C –

Evacuation Messages - Reykjavik OACC

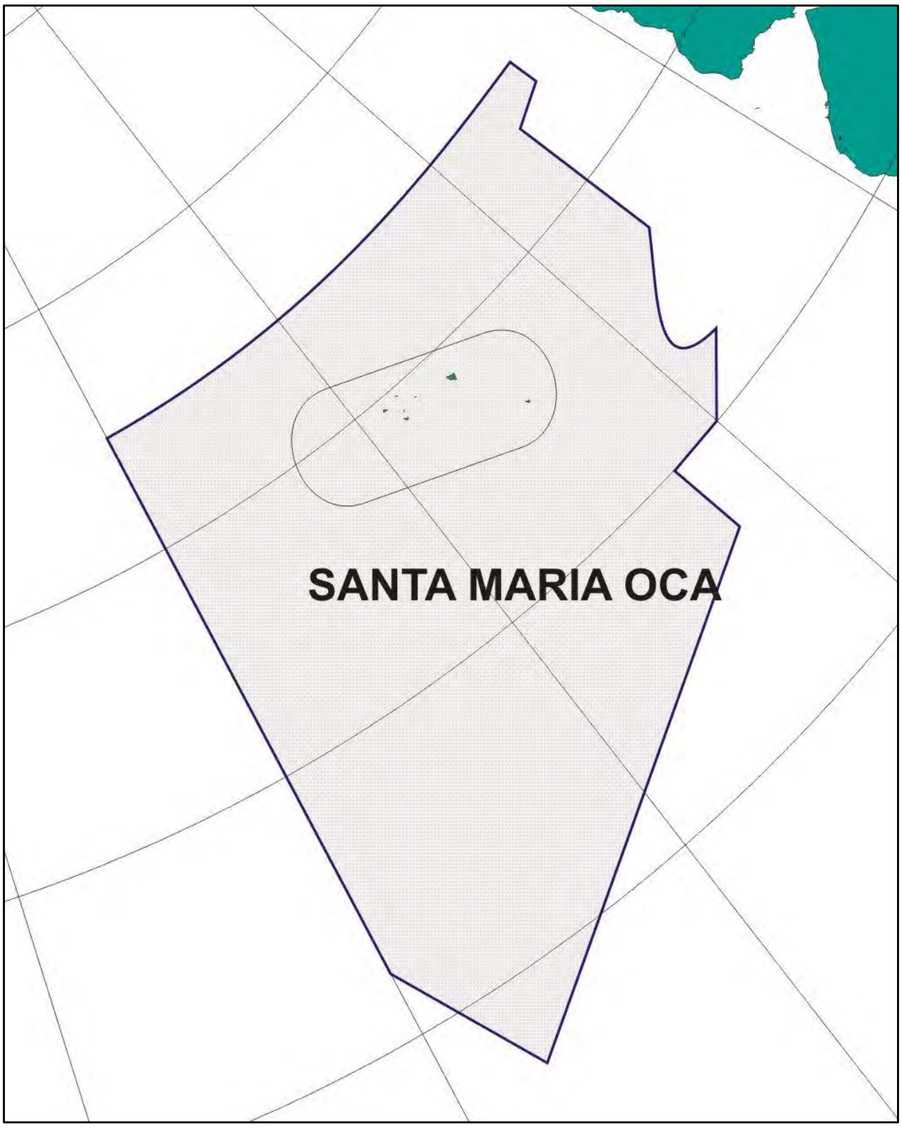
AFTN

DD BGGLZQZX BGSFYFYX CYQXYFYX CZEGZQZI CZQXZQZX
EGGXZQZX EGPXZQZX EIAAYFYX ENOBZQZX
XXXXXX BICCYFYX
SVC
Reykjavík Centre has been evacuated, personnel is on its way to BICC.
Telephone numbers: +354 568 4600, +354 568 4601.

ICELAND RADIO ON VOICE

Emergency evacuation of Reykjavik Centre is in progress. No air traffic control service will be provided by Reykjavik. Use extreme caution and monitor this frequency, emergency frequencies and air to air frequencies.

CHAPTER 4: DETAILED PROCEDURES – SANTA MARIA OACC



4.1 FIR FOR WHICH THE CONTINGENCY PLAN APPLIES

Santa Maria Oceanic FIR

4.2 FIRs WITH SUPPORTING PROCEDURES

Nil

4.3 NOTIFICATION PROCEDURES

General Provisions

The traffic in Santa Maria FIR is massively random, which causes problems for the routine implementation of OTS systems, in order to create an orderly flow.

Santa Maria OACC's communications are mainly provided by Santa Maria Radio Station, which uses ~~two~~ three families of HF frequencies (NAT A, NAT E ~~-~~and NAT ~~E~~H) and VHF ~~127.9Mhz and~~ 132.075Mhz

Family A - 3016 Khz ; 5598 Khz ; 8906 Khz ; 13306 Khz ; 17946 Khz.
Family E - 2962 Khz ; 6628 Khz ; 8825 Khz ; 11309 Khz ; 13354 Khz ; 17946 Khz
Family H – 3491 Khz; 6667 Khz.

Family A is also used by Shannon Radio Station, Gander Radio Station and New York ARINC, usually for flights with reporting points between 43N and 47N.

Family E is also used by New York ARINC and Canarias, usually for flights with reporting points south of 43N.

Family H is also used by Shannon Radio Station.

~~VHF 127.9 Mhz is available within or in the vicinity of Santa Maria TMA.~~
VHF 132.075 Mhz is available over Portugal's mainland, usually used for oceanic clearance request and delivery.

Within surveillance area (SSR / MLAT/ ADS-B) VHF DCP Communications is (are) assured on (VHF)132.150 Mhz , 129.400 Mhz and 121.500 Mhz.

Surveillance and Communications are also provided in Santa Maria FIR through the following data link services:

ADS~~-WPR and FMC WPR-~~C,
CPDLC and
Data Link Oceanic Clearance Delivery

Military aircraft shall follow the same procedures as civilian. If an airspace reservation is in progress the military headquarters at EUCARF will take the suitable decision, according to the type of contingency.

Levels of service

Limited Service ; A limited service may result from :

Staff shortage
partial loss of facilities
minor equipment failure
external traffic restrictions

No Service; no service situation may result from:

No staff
loss of Santa Maria facility
major equipment failure.

4.4 LIMITED SERVICE

Dispersal of traffic

Santa Maria OAC shall determine and coordinate necessary oceanic restrictions.
Traffic with oceanic clearance or already approved to enter Santa Maria FIR shall have priority over the remaining services. Traffic without oceanic clearances or not coordinated with Santa Maria OAC may be subject to restrictions to meet the limited oceanic service capability.

Communications

Communications services will be maintained using available equipment and with the assistance of adjacent facilities.

SATCOM equipped flights using INMARSAT network may contact Santa Maria Radio through published short codes 426302 and 426305.

SATCOM equipped flights using other satellite network than INMARSAT may contact Santa Maria Radio dialling directly +351 296 886 655.

Flights reporting via ADS and using CPDLC communications may maintain data link services until otherwise instructed by a ground facility.

Notification

Santa Maria OAC shall be responsible for notification of oceanic service changes. Notification will be through typical channels.

Santa Maria Radio Supervisor shall coordinate with adjacent Aero-radio facilities the required level of assistance.

Roles and responsibilities of adjacent facilities

The action required of adjacent service providers will vary depending of the nature of the service limitation. After notification by Santa Maria OAC, the adjacent facilities shall be responsible to implement the necessary procedures to meet the Santa Maria Oceanic restrictions.

Adjacent Aero-radio facilities shall be responsible to implement the necessary procedures to meet the Santa Maria Radio requirements.

Separation Minima

Santa Maria shall determine and co-ordinate additional separation requirements according to the level of service available.

Contingency Tracks

Santa Maria shall be responsible to organize contingency tracks if necessary. These will be published through typical channels.

Air Traffic Management

Santa Maria shall coordinate traffic restrictions with the adjacent units. Restrictions may be applied to the following: Traffic volume (flow rate, slots); Oceanic routings; En-route clearance change requests; Separation to be applied. Network Manager Operations Center (NMOC) can be requested to assist with establishing and co-ordinating service levels in Santa Maria OAC for the westbound flow.

4.5 NO SERVICE

Santa Maria OAC contains the following operations: Santa Maria Oceanic, Santa Maria Terminal Area, Santa Maria Approach, Santa Maria Tower and Santa Maria Radio Station. A catastrophic event would destroy both Control and Communications for Santa Maria Oceanic, Santa Maria Terminal Area, Approach and Aerodrome Control for Santa Maria Airport and Santa Maria Radio.

Dispersal of traffic

Traffic within Santa Maria FIR or already coordinated with Santa Maria OAC, shall comply with their Oceanic clearance. All other traffic that has not been approved by Santa Maria Oceanic Control shall remain clear of Santa Maria FIR.

Communications

Lisboa ACC will monitor aircraft as far as possible by VHF coverage. Shanwick Radio Station will monitor aircraft until 030W on HF (family A). Gander Radio Station will monitor aircraft between 45N and 40N on HF (family A). New York will monitor aircraft below 40N until 30W on HF (family E).

Flights reporting via ADS and using CPDLC communications must revert to voice procedures unless so instructed by Shanwick Radio, Gander Radio or New York Radio.

Notification

In the event of no service situation Santa Maria Oceanic shall be responsible for notification to Lisboa ACC, Shanwick OAC, New York OAC and Sal ACC. This may not be possible in the event of an unexpected catastrophic situation. Any Control unit that is unable to establish communications with Santa Maria OAC shall request assistance in determining the status of Santa Maria OAC from other units adjacent to Santa Maria FIR.

4.6 Roles and Responsibilities of Adjacent OAC's and ACC's

Until Contingency tracks can be implemented adjacent units will take immediate actions for necessary traffic management procedures in accordance with this plan. The adjacent units will not issue re-clearances within Santa Maria FIR after notification of the no service situation, unless any loss of separation minima between aircraft is detected. Madrid ACC, Piarco ACC, Dakar OAC and Sal OAC shall not clear any aircraft into Santa Maria FIR after notification of the loss of service.

Lisboa ACC will ensure that Lisboa RCC, Madrid ACC and Canarias ACC are advised of the situation, and will assist any emergencies between 015W and 020W when possible by VHF coverage. Lisboa ACC will change the cleared traffic to Shannon Radio Station.

Shanwick OAC will ensure that Gander OAC is advised of the situation. Shannon Radio Station will change the cleared traffic to New York ARINC or to Gander Radio Station after 30W as appropriate.

New York OAC will ensure that Piarco is advised of the situation. New York executive controllers shall verify if Eastbound traffic coordinated before the notification of the loss of the Santa Maria facility, are separated at least until 20W. New York OAC will assist any emergencies between 30W and 40W, and will change the cleared traffic to Shannon Radio Station or Gander Radio Station as appropriate.

Ponta Delgada and Horta approach will monitor all traffic within surveillance coverage (230 NM) and will assist any emergencies between 020W and 030W.

Lajes Rapcon will monitor all aircraft within radar coverage (200 NM) and will assist any emergencies between 020W and 030W. Lajes airport will be available H24 for any distress situation for landing purposes without prior military authorization.

Sal OAC will ensure that Dakar OAC is advised of the situation.

Separation

All separation standards shall be increased by 10 minutes.

4.7 Contingency Tracks

When no service situation occurs within Santa Maria FIR the contingency tracks listed below shall be implemented. The tracks will be effective after coordination between adjacent units.

Period 2300 UTC - 0630 UTC

Eastbound tracks

EAST1101	29N040W 33N 030W 36N020W LUTAK ESP - FL 310,330,350,370,390
EAST1102	43N040W 42N030W 41N020W DETOX DIRMA - FL 290,320,350,390
EAST1103	45N030W 44N020W ARMED PRT - FL 290,320,350,390
EAST1104	34N040W 40N030W 45N020W 47N 008W - FL 330, 340, 360, 370, 380, 400
EAST1105	40N040W 45N030W 47N 020W - FL 330,340,360,370,380,400
EAST1108	28N040W ULTEM FL 340,380

Westbound tracks

WEST1106	GUNTI 39N020W 39N030W 38N040W - FL 280
WEST1107	45N020W 40N030W 34N040W - FL 310
WEST1109	ULTEM 28N040W FL 320,360

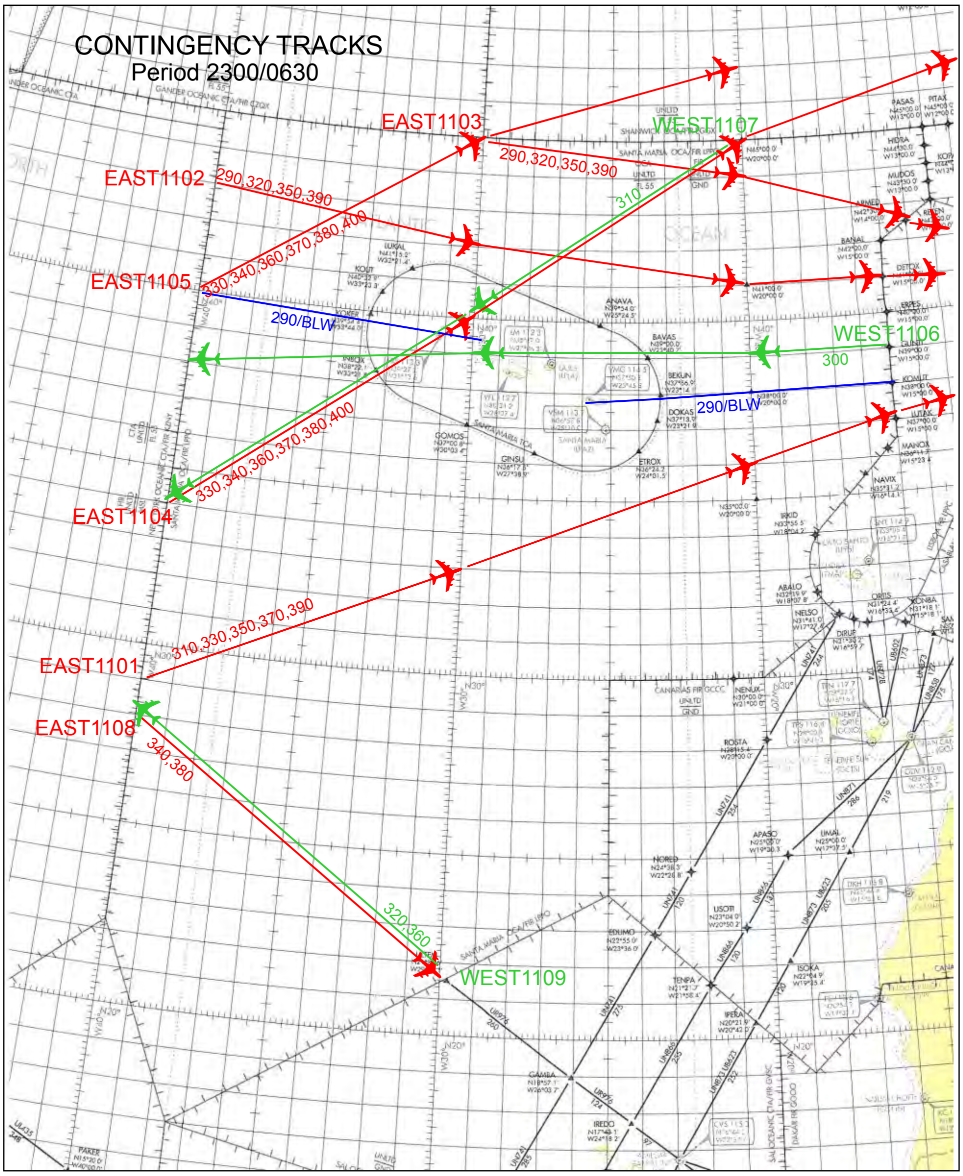


Figure: Contingency night tracks for Santa Maria CTA/FIR during the period 2300/0630 except AZOCON tracks which are effective 24 hours a day.
See text above.

Period 1000 UTC - 1800 UTC

Westbound tracks

WEST2201	DETOX 41N020W 42N030W 43N040W - FL 310, 350,370,390
WEST2202	GUNTI 39N020W 39N030W 38N040W - FL 330, 350,370,390
WEST2203	LUTAK 36N020W 33N030W 29N040W - FL 310, 330, 350,370,390
WEST2204	45N015W 42N020W 37N030W 32N040W - FL 300, 320, 340,360, 380, 400
WEST2205	45N020W 40N030W 35N040W - FL 300,320,340,360,380,400
WEST2209	ULTEM 28N040W – FL320,360

Eastbound tracks

EAST2206	40N040W 45N030W 47N020W - FL 330
EAST2207	38N040W 39N030W 39N020W GUNTI - FL310
EAST2208	28N040W ULTEM – F340,380

Flights between Santa Maria Radar and Lisboa FIR

AZOCON01 KOMUT 38N020W BEKUN VMG - FL 290 and below (according to direction of flight).

Flights between Santa Maria Radar and New York FIR

AZOCON02 40N040W FRS LADOX - FL 290 and below (according to direction of flight)

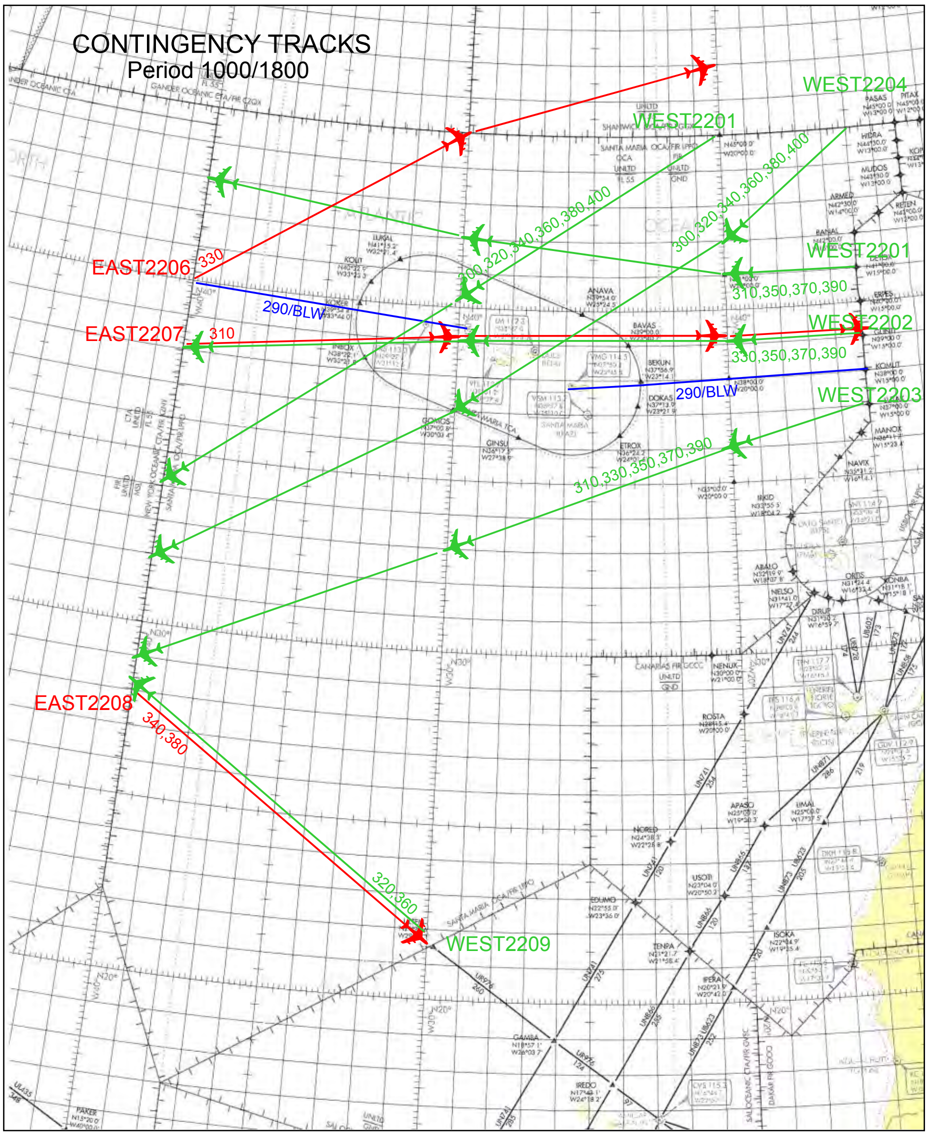


Figure: Contingency day tracks for Santa Maria CTA/FIR during the period 1000/1800, except AZOCON tracks which are effective 24 hours a day. See text above.

Appendix A –

Procedures by Adjacent Areas in Event of Santa Maria Evacuation

NONE

Appendix B –

Contact Details – Santa Maria OACC

Air Traffic Flow Management, Recovery Team and Contacts List

The recovery team will carry out the appropriate management and coordination with the adjacent units and facilities in order to establish an air traffic flow as the Contingency Plan and the recovery actions allow a limited service to be restored.

Santa Maria OACC	Telephone Number	AFTN
Atlantic Operations Director	+351 296 820 501	
Operations Division Manager	+351 296 820 504	
Operations Division Manager	+351 296 820 508	
Radio Station Manager	+351 296 820 509	
Maintenance Manager	+351 296 820 512	
ACC Watch Manager	+351 296 820 400 +351 296 886 299 +351 296 820 422 (fax)	LPAZZOZX
Radio Station Watch Manager	+351 296 820 401	
Lajes RCC	+351 295 513 686 +351 295 540 792 (fax)	

CHAPTER 5: DETAILED PROCEDURES – NEW YORK OACC

New York ARTCC (NY OAC)

The procedures outlined below are to be used as guidance for pilots/operators/adjacent ANSPs following a sudden withdrawal or reduction of ATC service.

5.1 FIR FOR WHICH THE CONTINGENCY PLAN APPLIES

NY OAC

5.2 FIRs WITH SUPPORTING PROCEDURES*

FACILITY	APPENDIX
*Boston ARTCC	Appendix 1/1A
*Moncton ACC	Appendix 2/2A
*Gander ACC	Appendix 3/3A
*Santa Maria ACC	Appendix 4/4A
*Piarco ACC	Appendix 5/5A
*San Juan CERAP	Appendix 6/6A
*Miami ARTCC	Appendix 7/7A
*Jacksonville ARTCC	Appendix 8/8A
Fleet Area Control and Surveillance Facility, Virginia Capes	Appendix 9/9A
NY OAC FIR Contingency Routes	Appendix 10
FAA Air Traffic Control System Command Center	Appendix 11
Evacuation Message	Appendix 12
Adjacent Agencies	Appendix 13
Adjacent Agencies Communications	Appendix 14
Consolidated New York Center Contact Details	Appendix 15
VOLMET International Broadcast Information	Appendix 16

5.3 NOTIFICATION PROCEDURES

In a limited service situation

Notification of any service limitations and traffic management measures will be issued to operators and adjacent facilities via AFTN messages, NOTAMs, FAA Command Center advisories or by telephone.

In a no service situation

NY Oceanic Area of Control (OAC) may have to be evacuated and/or relocated. The oceanic portion of the ARTCC will endeavour to provide a limited ATC service through Aeronautical Radio Inc. (ARINC) as soon as possible after evacuation commences, in Ronkonkoma, New York, USA, or to the National Aviation Facilities Experimental Center (NAFEC) in Atlantic City, New Jersey, USA. Appropriate messages will be sent to all affected air traffic control facilities and aircraft operators.

Air Traffic Flow Management

New York Center shall coordinate any necessary traffic management initiatives with the FAA Air Traffic Control System Command Center (ATCSCC). Such measures may include, but are not limited to, temporary capacity limitations and associated restrictions, airway usage and altitude availability procedures, separation standard modifications and tactical rerouting measures.

Responsibilities of Adjacent ANSPs

The action of adjacent ANSPs will vary depending on the nature of the service limitation. Where such action is not contained within the Inter-Center Letters of Agreement (LOAs) the requirement will be promulgated at the time of the initial failure and will include any FAA Air Traffic System Command Center advisories/restrictions.

5.4 LIMITED SERVICE - PROCEDURES

5.4.1 Disruption of ground/air communication capability

If communication services cannot be adequately maintained by Aeronautical Radio Inc. HF communications services on the North Atlantic will be delegated to the other International radio stations; Gander International Flight Service Station (Gander Radio) and/or Santa Maria Radio. Appropriate frequencies will be published in a NOTAM.

5.4.2 Disruption of ability to provide control services

NY OAC shall determine, co-ordinate, and issue any necessary restrictions to meet the service limitation. Aircraft having valid oceanic clearances shall have priority over any other traffic. En route re-clearances of traffic shall be limited to aircraft in emergency situations. Traffic without an oceanic clearance may be subject to tactical traffic management procedures/restrictions to meet the requirements of the service limitation.

The route structure included in this contingency plan is intended to provide adjacent ANSPs and aircraft operator’s information as to what can be expected during limited service operation. However, real-time operations affected by meteorological conditions, restricted airspace, etc., may necessitate the use of alternative routes, designation of single direction routes, and/or altitudes.

5.5 NO SERVICE – PROCEDURES

5.5.1 Loss of ground/air communication capability

If communication services cannot be conducted by any radio station throughout the entire NY OAC, no traffic will be permitted to enter NY OAC airspace. Limited service may be provided in those identified airspace areas where reliable communications are still possible.

5.5.2 Loss of ability to provide control services

If the loss of ability to provide control services is due to communications failure at the NYARTCC, NY OAC area will endeavour to relocate to the Aeronautical Radio Inc. (ARINC) communications facility in Ronkonkoma, New York, USA, and provide limited ATC services from there.

If ARINC is also non-operational, or if NYARTCC is not expected to become operational within a reasonable period of time, the Oceanic section is expected to be relocated to the National Aviation Facilities Experimental Center (NAFEC) located in Atlantic City, New Jersey, USA. After the relocation, appropriate contingency messages will be sent to all the affected ANSPs and operators and limited air traffic services will be provided thereafter as soon as possible.

5.6 FLIGHT CREW AND OPERATOR PROCEDURES

5.6.1 Airborne flights within the NY OAC

ARINC, the HF communication service provider for the New York OAC is remotely located, and will therefore unlikely be affected, however, HF frequency congestion is likely. Communications should be kept to a minimum.

Flights operating with an oceanic clearance will be expected to continue in accordance with the last clearance issued unless otherwise advised by ATC. Aircrew shall use extreme caution and use all available means to detect any conflicting traffic.

Flights should remain in/establish communications with ARINC, even if logged on to CPDLC. Flights unable to contact ARINC should establish communication with the next agency (see Appendices 13 and 14 ‘Adjacent Agencies’, ‘Adjacent Agencies Communications’) at the earliest opportunity stating current position, cleared flight level, next position and estimate and subsequent position. When ADS equipped flights are notified of a New York OAC evacuation they must revert to voice position reporting until clear of New York OAC, or otherwise notified (ADS/CPDLC reports may not have been received by the next agency). Pilots should note that they may be asked to log-on to Santa Maria “LPPO” or Gander “CZQX” when within the New York OAC, they should not initiate this action until instructed to do so, or upon exiting New York OAC.

Any flights involved in altitude changes should complete the maneuver as soon as possible in accordance with the clearance.

Flight crews should also continuously monitor VHF frequency 121.5 and 123.45 in order to exchange position information with other flights in the event they’re unable to communicate on HF.

Aircraft equipped with satellite telephone that are unable to communicate with ATC on HF and/or VHF, or via CPDLC, should contact ARINC (INMARSAT short code for NYC is 436623)

5.6.2 For flights approaching the New York OAC when the contingency is activated

Not in Receipt of an Oceanic Clearance

In the event that New York OAC must be evacuated, only aircraft with received and acknowledged oceanic clearances are permitted to transit New York OAC.

If unable to obtain or acknowledge an oceanic clearance, flights shall re-route around the New York OAC or land at an appropriate airfield. The adjacent areas will issue advice on procedures to be followed.

In receipt of an acknowledged Oceanic Clearance

Aircraft operating with a received and acknowledged oceanic clearance can, at pilot's discretion, continue, but must expect a limited ATC service within the New York OAC. Aircrews shall use extreme caution and use all available means to detect any conflicting traffic.

However, due to the uncertainty surrounding the contingency situation, pilots are strongly advised to consider rerouting around the New York OAC airspace.

5.7 CONTINGENCY ROUTE STRUCTURE

NYARTCC has developed and will activate fixed routes to be used in conjunction with, or in lieu of, the Organized Track System (OTS). The enclosed named and fixed routes in the NY OAC will be implemented. The implementation may include all or a portion of the route options depicted in this document based on the nature of the contingency. Further guidance will be published at the time of the contingency.

New York Center will be implementing a contingency plan whose main philosophy will be separating routes by altitude stratification based on direction and distance of flight.

Stratification Category	*Altitude Range*
Low Altitude	FL 290 and below
Mid Altitude	FL 300 – FL 350
High Altitude	FL 360 and above

Stratification categories and their associated altitude bands have been developed based upon the expected flight distance that will be flown. The shorter distances between the U.S. mainland, Canada to/from the Bermuda Area will receive the low altitude routing band, the mid distance between North America and the Caribbean and South America will receive the mid altitude routing band, and flight between the Americas and the Caribbean to/from Europe will receive the high altitude routing.

5.7.1 For activation within NY OAC.

See Appendices 1 through 16.

5.8 GENERAL PROVISIONS

Military Operators

Military aircraft shall follow the same procedures as civilian aircraft. If an airspace reservation is in progress or a critical mission is scheduled the Central Altitude Reservation Facility (CARF) at the FAA ATCSCC will make a suitable decision regarding the continuation of the airspace reservation, according to the mission requirements and the type of contingency.

Separation Standards

New York OAC will be responsible for ensuring through the FAA ATCSCC the coordination and implementation of any additional separation requirements.

Long Term Contingency Arrangements

The NY OAC section of the NYARTCC would possibly be relocated to the National Aviation Facilities Experimental Center (NAFEC) located in Atlantic City, New Jersey, USA.

Appendix 1 –

Contingency Procedures between NY OAC and Boston ARTCC

Upon notification that NY OAC has lost its ability to provide air traffic control service, Boston ARTCC (ZBW) will reroute all airborne eastbound flights that are flight planned into NY OAC (and are still west of longitude 67 west) into Moncton ACC airspace. ZBW will coordinate with Moncton ACC as to the routes and altitudes required for these flights to remain clear of airspace within the NY OAC.

Any eastbound aircraft that is east of longitude 67 west, and is in communication and radar contact with ZBW, may be rerouted (with the concurrence of Moncton ACC) northward into Moncton ACC airspace without prior coordination with ZNY. ZBW or Moncton will subsequently advise ZNY of the reroute.

Any westbound aircraft, east of longitude 67 west, that is in communication and radar contact with ZBW may be rerouted by ZBW (into their own airspace) without coordinating with ZNY in order to facilitate rerouting eastbound aircraft to exit or remain clear of NY OAC airspace.

If ZNY has adequate VHF/UHF radio and radar service capability, flights with destinations in the western Caribbean or the Florida peninsula may be rerouted by ZBW through the ZNY offshore Sectors 65 (JOBOC), 86 (ATLANTIC), then via routing LEXAD M201 HANRI, through Sectors 82 (PAEPR), and 83 (HANRI) into Jacksonville Center.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the following routes.

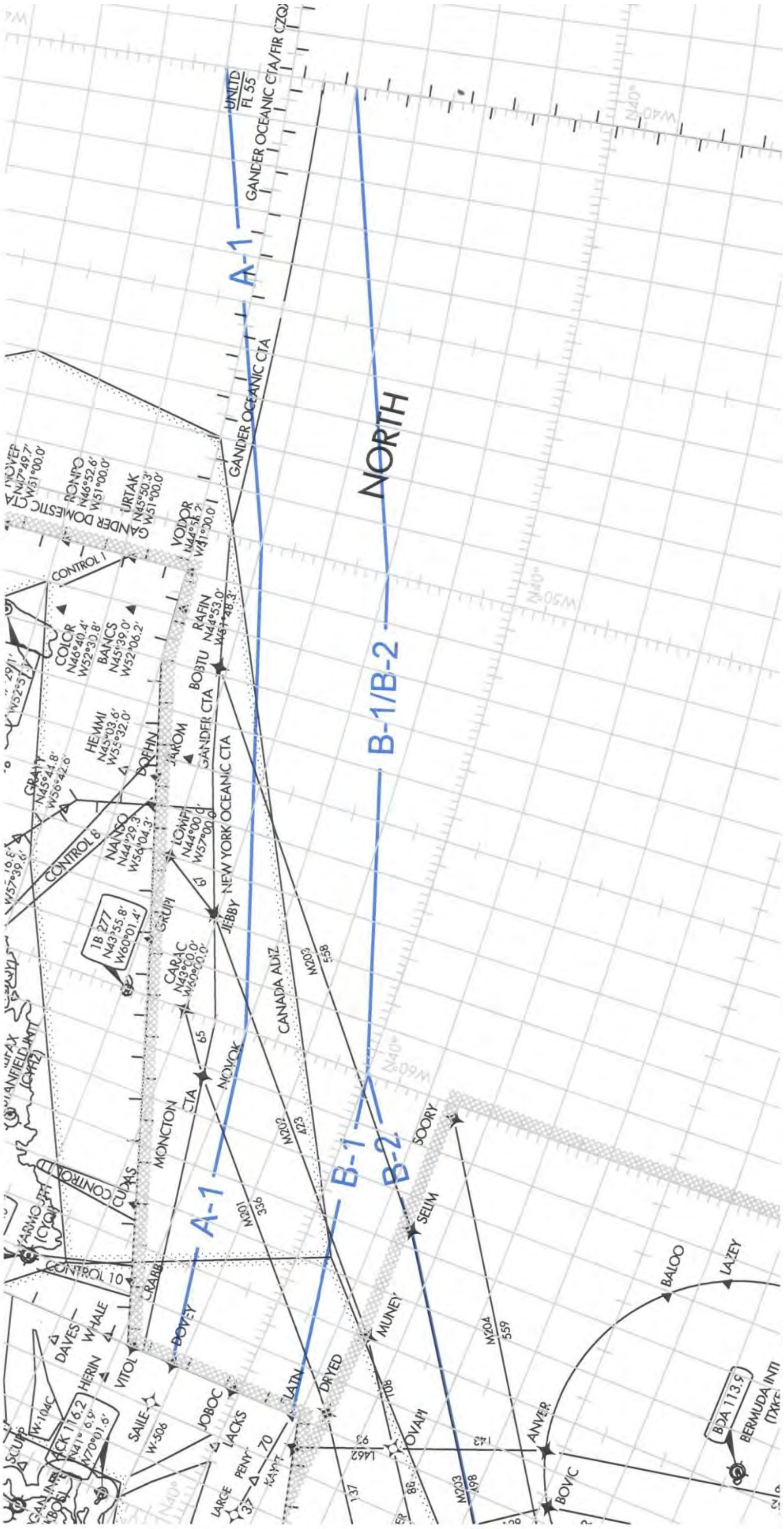
Rte Name	Route Definition (See Pictorial - Appendix 1A-1/2)	Altitudes
A-1	DOVEY 4200N/06000W 4400N/05000W 4600N/04000W FPR (and the reverse)	FL350 and below
B-1/B-2	SLATN 4000N/06000W 4200N/05000W 4400N/04000W FPR (and the reverse)	FL350 and below

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

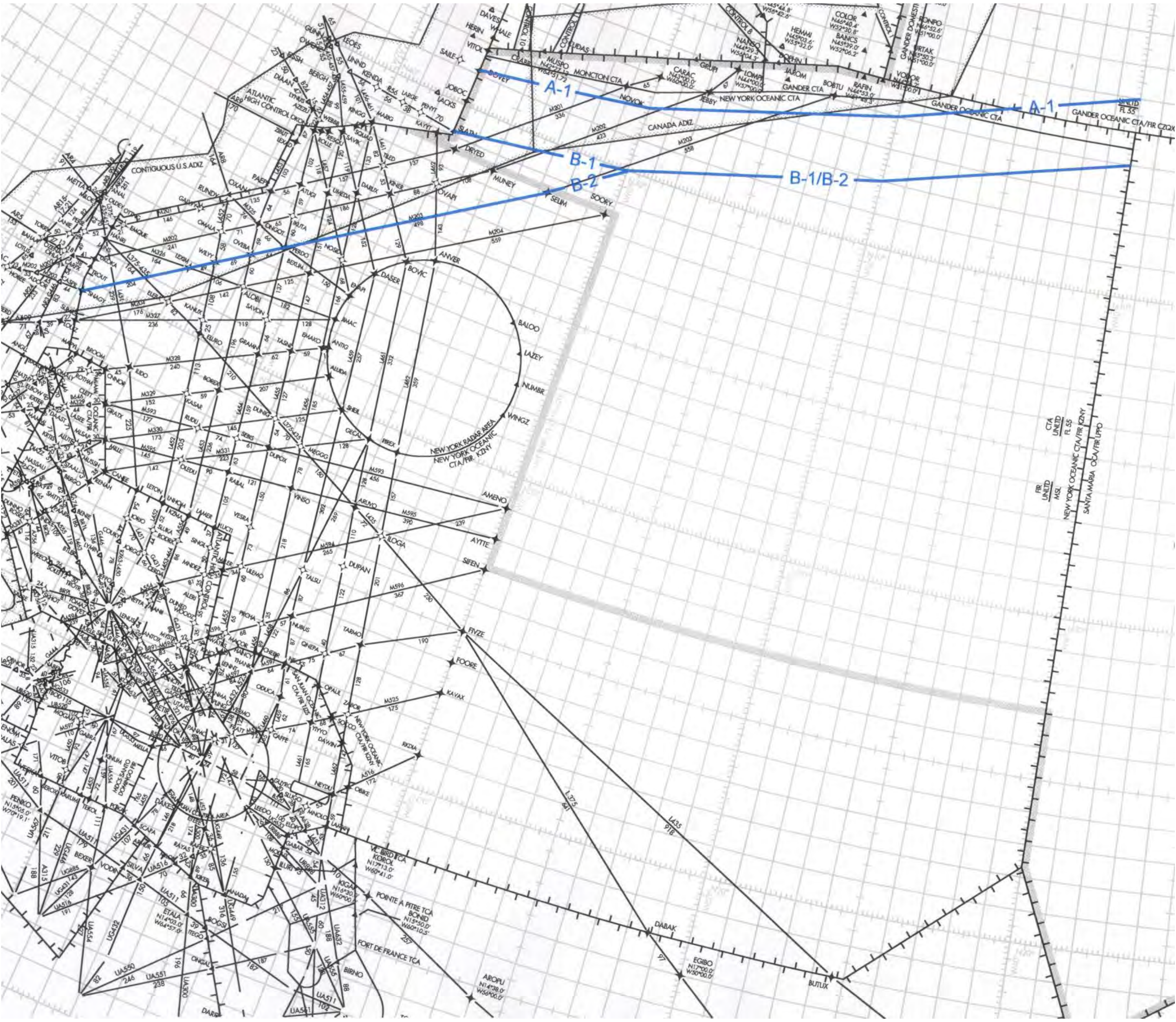
New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

Boston Center (ZBW) Telephone/Facsimile Numbers:		
ZBW Watch Desk	+1-603-879-6655	Fax: +1-603-879-6717
ZBW Traffic Management Unit	+1-603-879-6666	Fax: +1-603-879-6717
ZBW Procedures Office	+1-603-879-6858	Fax: +1-603-879-6410
ZBW Traffic Management Officer	+1-603-879-6644	Fax: +1-603-879-6717
ZBW Technical Operations Area	+1-603-879-6729	Fax: +1-603-879-6934

Appendix 1A-1 - Routes (A-1, B-1, B-2) pictorial



Appendix 1A-2 - Routes (A-1, B-1, B-2) pictorial



Appendix 2 –

Contingency Procedures between NY OAC and Moncton ACC

Upon notification that NY OAC has lost its ability to provide air traffic control service, Moncton ACC will reroute all westbound traffic that is flight planned to enter NY OAC through the Boston ARTCC, and all eastbound traffic through the Gander ACC.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the following routes.

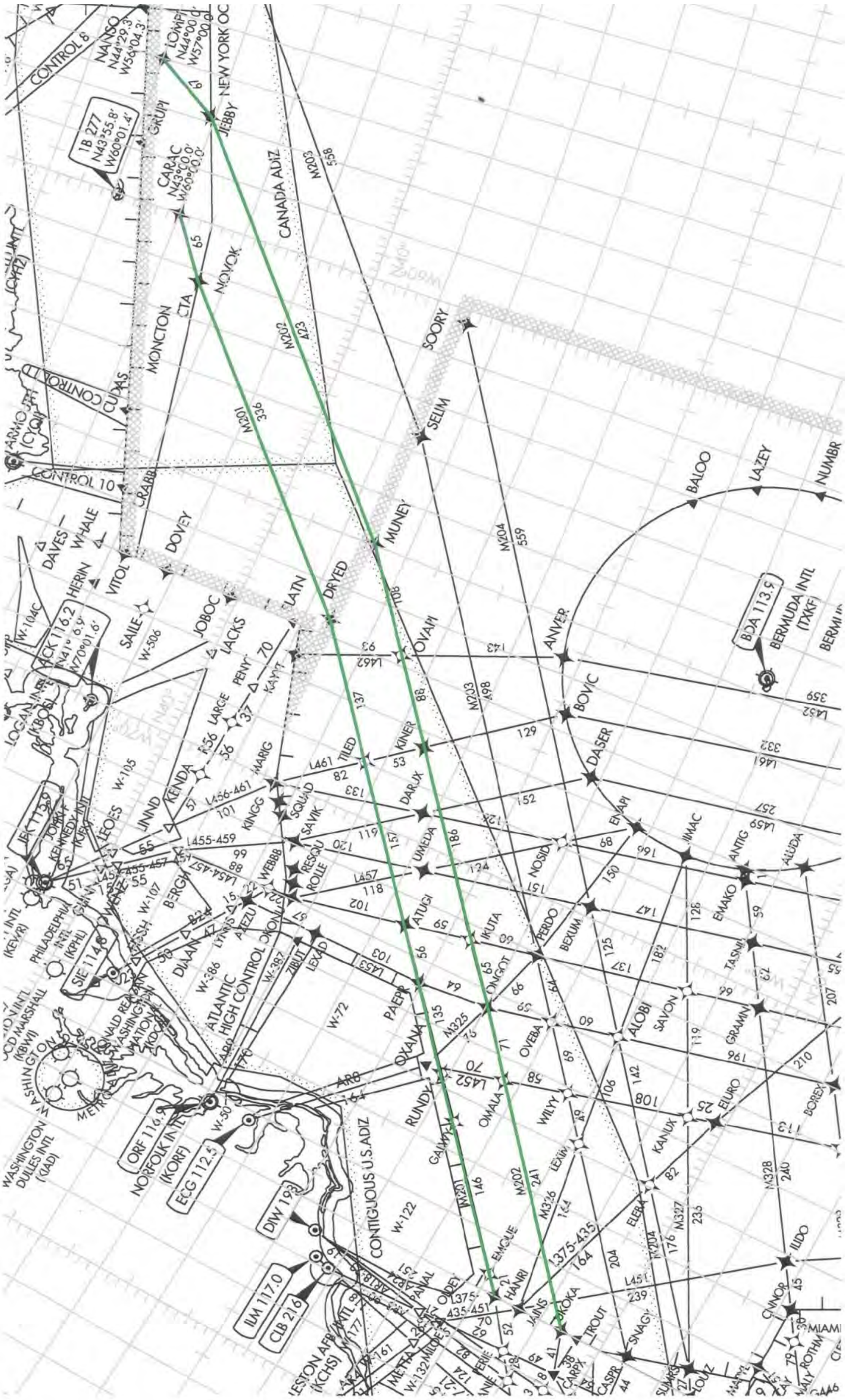
Rte Name	Route Definition (See Pictorial - Appendix 2A-1/2)	Altitudes
M201	HANRI M201 NOVOK CARAC FPR (and the reverse)	FL360 and above
M202	UKOKA M202 JEBBY LOMPI FPR (and the reverse)	FL360 and above

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

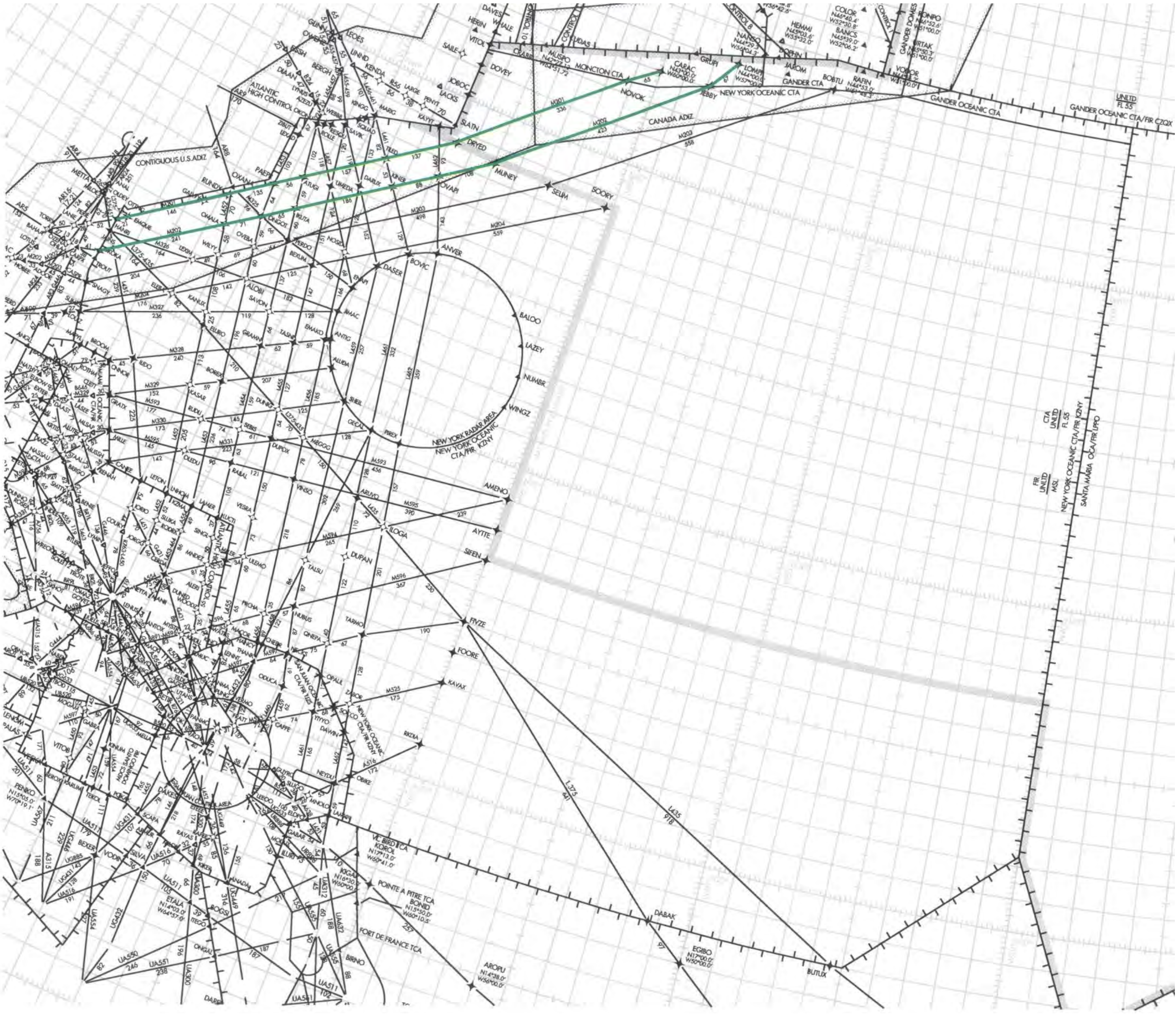
New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

Moncton ACC (YQM) Telephone/Facsimile Numbers:		
Nav Canada National Operations Center	+1-613-248-4087	Fax: +1-613-248-3983
YQM Moncton ACC (at NOVOK or JEBBY)	+1-506-867-7175	Fax: +1-506-867-7180
YQM Moncton ACC (at NOVOK or JEBBY)	+1-506-867-7173	Fax: +1-506-867-7180

Appendix 2A-1 - Routes (M201, M202) pictorial



Appendix 2A-2 - Routes (M201, M202) pictorial



Appendix 3 –

Contingency Procedures between NY OAC and Gander ACC

Upon notification that NY OAC has lost its ability to provide air traffic control service, Gander ACC will reroute all westbound traffic that is flight planned to enter NY OAC through the Moncton ACC, and will retain all eastbound traffic within their airspace.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the following routes.

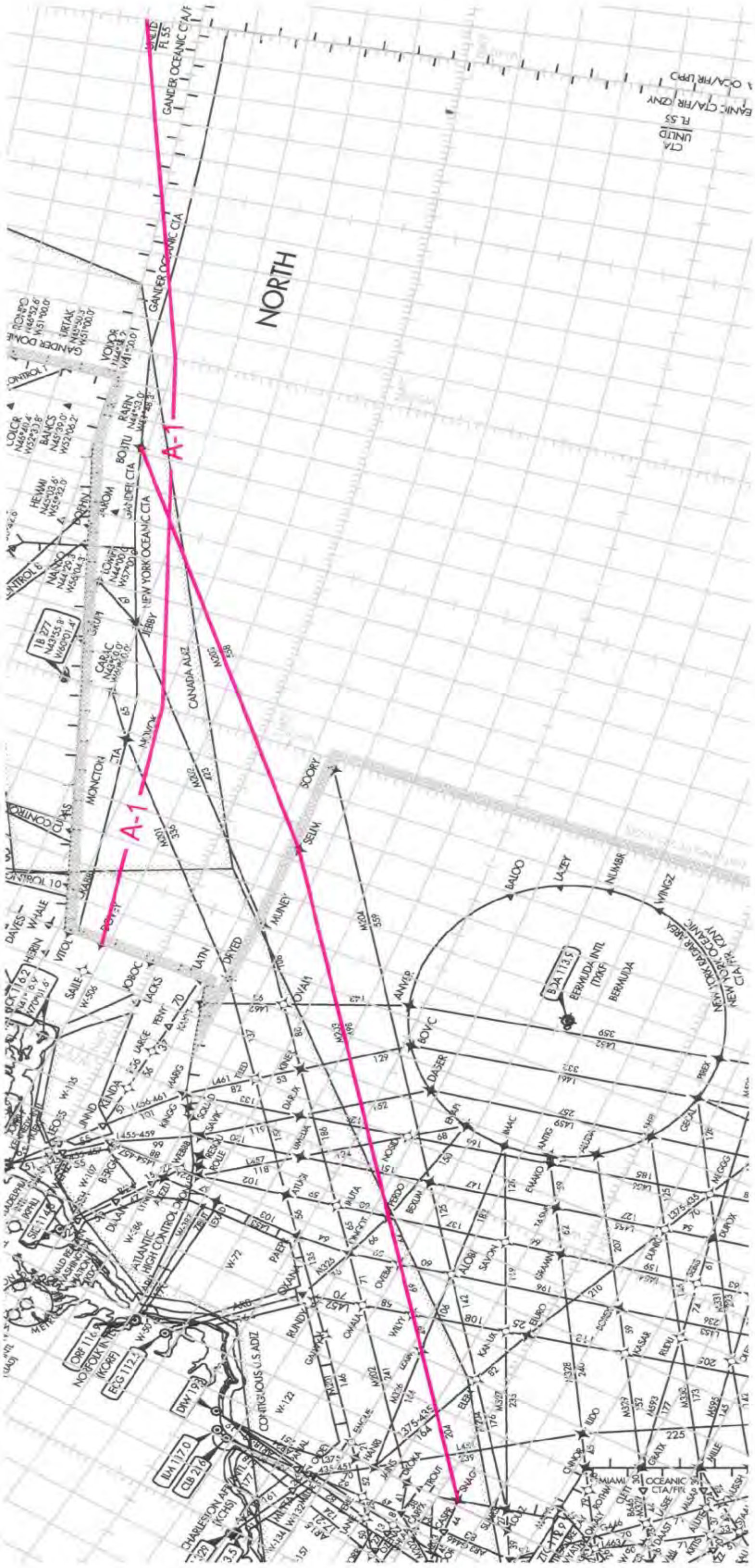
Rte Name	Route Definition (See Pictorial - Appendix 3A-1/2)	Altitudes
A-1	DOVEY 4200N/06000W 4400N/05000W 4600N/04000W FPR (and the reverse)	FL350 and below
M203	SNAGY M203 BOBTU FPR (and the reverse)	FL360 and above

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

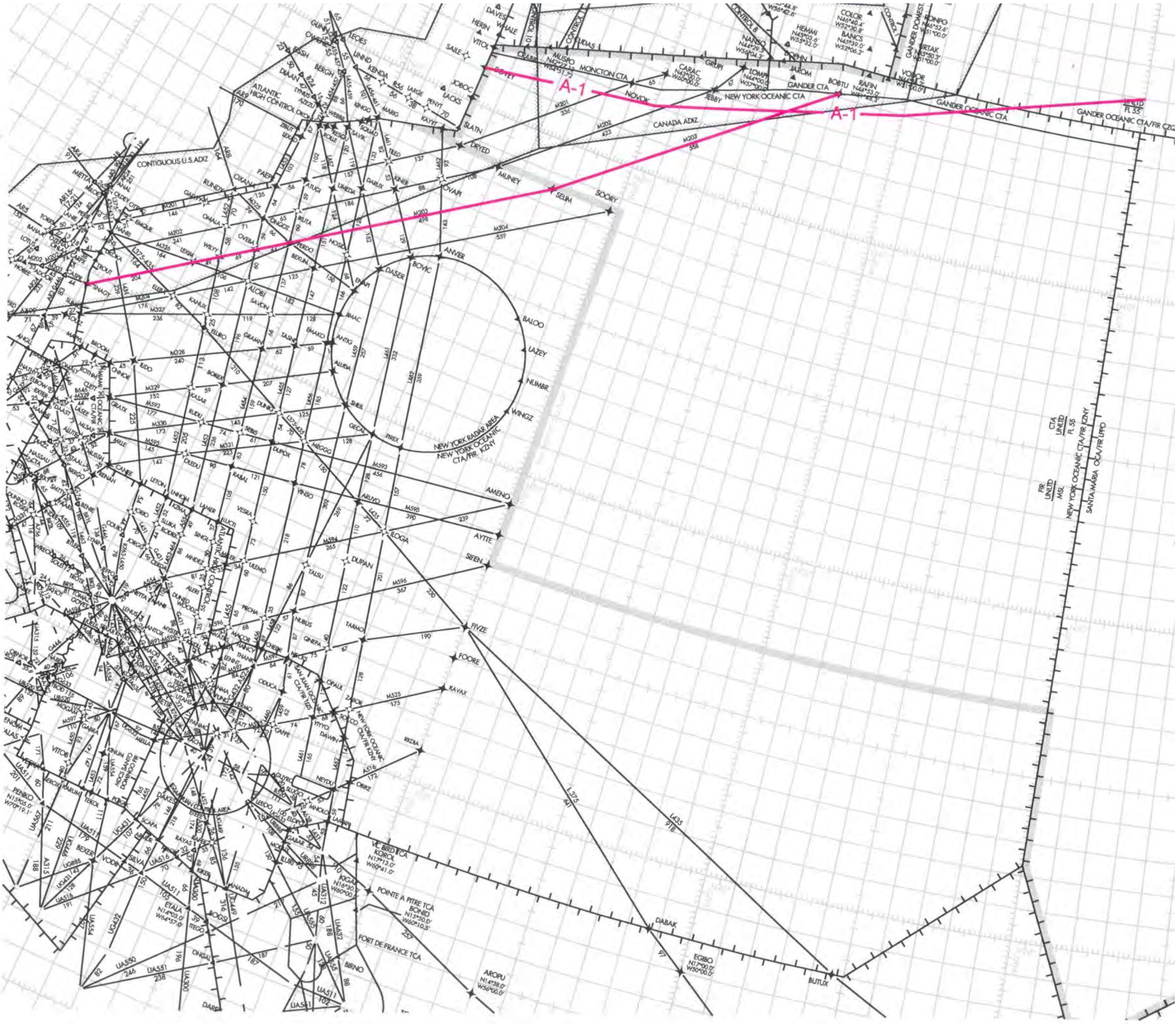
New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

Gander ACC (YQX) Telephone/Facsimile Numbers:		
Nav Canada National Operations Center	+1-613-248-4087	Fax: +1-613-248-3983
YQX Gander Shift Manager	+1-709-651-5207	Fax: +1-709-651-5324
YQX Gander Shift Manager	+1-709-651-5203	Fax: +1-709-651-5324
YQX Gander Oceanic Supervisor	+1-709-651-5324	Fax: +1-709-651-5324
Gander Radio Supervisor	+1-709-651-5212	Fax: +1-709-651-5344

Appendix 3A-1 - Routes (A-1, M203) pictorial



Appendix 3A-2 - Routes (A-1, M203) pictorial



Appendix 4 –

Contingency Procedures between NY OAC and Santa Maria

Upon notification that NY OAC has lost its ability to provide air traffic control service, Santa Maria ACC will reroute traffic that is flight planned to enter ZNY airspace either into Gander ACC or Piarco ACC airspace.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the following routes.

Rte Name	Route Definition (See Pictorial - Appendix 4A)	Altitudes
B-1	SLATN 4000N/06000W 4200N/05000W 4400N/04000W FPR (and the reverse)	FL350 and below
M326 then C-1 after BALOO	JAINS M326 JIMAC BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below to JIMAC, then any useable altitude
M326 then D-1 after NUMBR	JAINS M326 JIMAC NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below to JIMAC, then any useable altitude
M203 then B-2 after SELIM	SNAGY M203 SELIM 40000N06000W 42000N/05000W 4400N/04000W FPR (and the reverse)	FL360 and above
M327 then C-1 after BALOO	SUMRS M327 JIMAC BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below to JIMAC, then any useable altitude
M327 then D-1 after NUMBR	SUMRS M327 JIMAC NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below to JIMAC, then any useable altitude
M328 then C-1 after BALOO	CNNOR M328 ANTIG BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above to ANTIG, then any useable altitude
M328 then D-1 after NUMBR	CNNOR M328 ANTIG NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below or FL 360 and above to ANTIG, then any useable altitude
M329 then C-1 after BALOO	GRATX M329 ALUDA BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below or FL360 and above to ALUDA, then any useable altitude
M329 then D-1 after NUMBR	GRATX M329 ALUDA NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above to ALUDA, then any useable altitude
M330 then C-1 after BALOO	MILLE M330 SHEIL BALOO 3500N06000W 3900N05000W 4200N04000W FPR (and the reverse)	FL290 and below, or FL360 and above to SHEIL, then any useable altitude

Rte Name	Route Definition (See Pictorial - Appendix 4A)	Altitudes
M330 then D-1 after NUMBR	MILLE M330 SHEIL NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above to SHEIL, then any useable altitude
M331 then C-1 after BALOO	CANEE M331 GECAL BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below, or FL 360 and above to GECAL, then any useable altitude
M331 then D-1 after NUMBR	CANEE M331 GECAL NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above to GECAL, then any useable altitude
M594 then E-1 after AMENO	MLLER M594 AMENO 3400N/05000W 3800N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
M596 then F-1 after SIFEN	WATRS M596 SIFEN 3200N/05000W 3600N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above

Appendix 4-2

Rte Name	Route Definition (See Pictorial - Appendix 4A-1/2/3)	Altitudes
M597 then F-1A after FIVZE	NECKS M597 FIVZE 3200N/05000W 3600N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
F-2	SOCOO M525 KAVAX 2800N/05000W 3300N/04000W FPR (and the reverse)	Any useable altitude
G-1	1800N/06000W 2500N/05000W 3100N/04000W FPR (and the reverse)	Any useable altitude
H-1	1800N/05600W 2200N/05000W 2800N/04000W FPR (and the reverse)	Any useable altitude

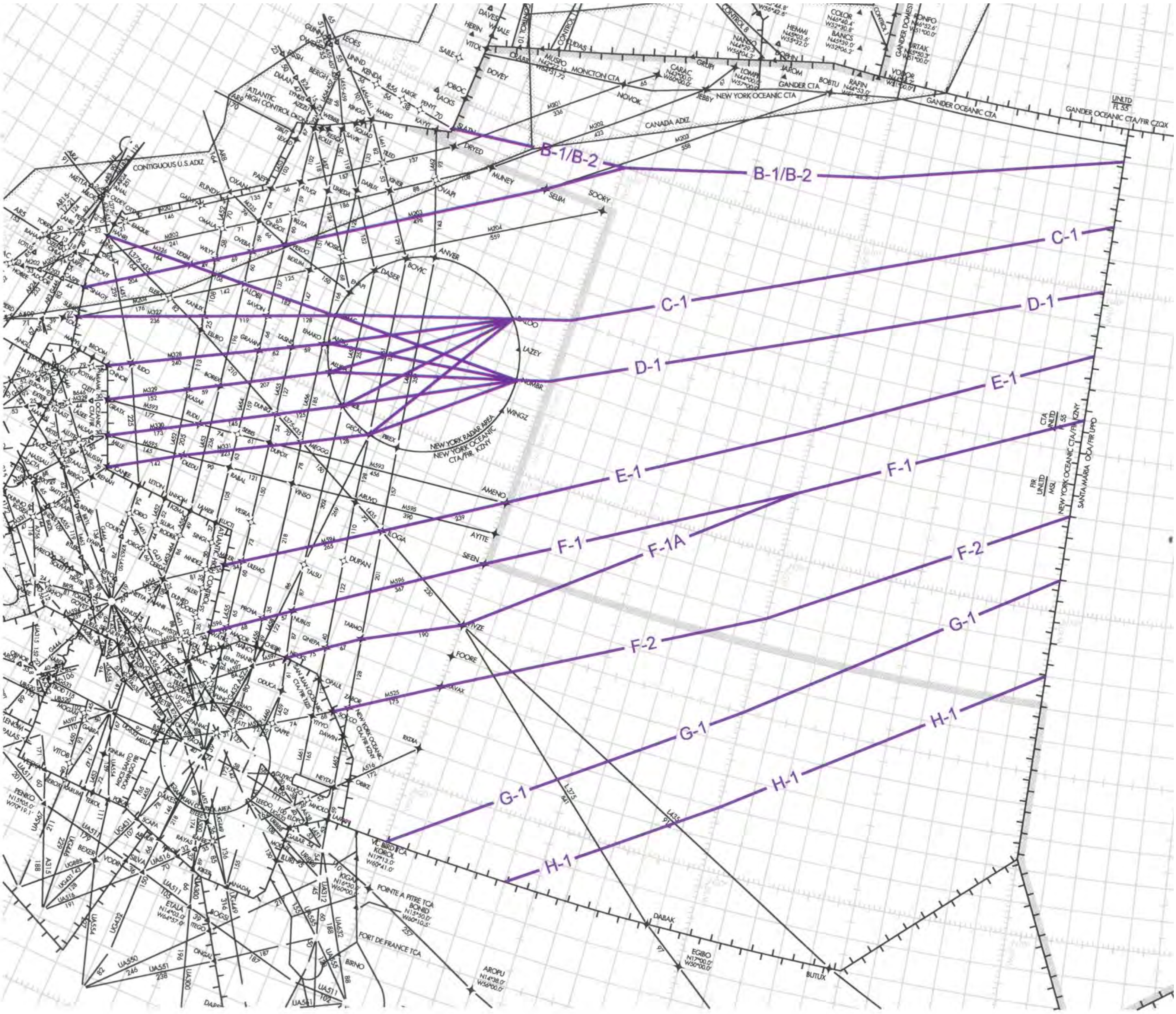
If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

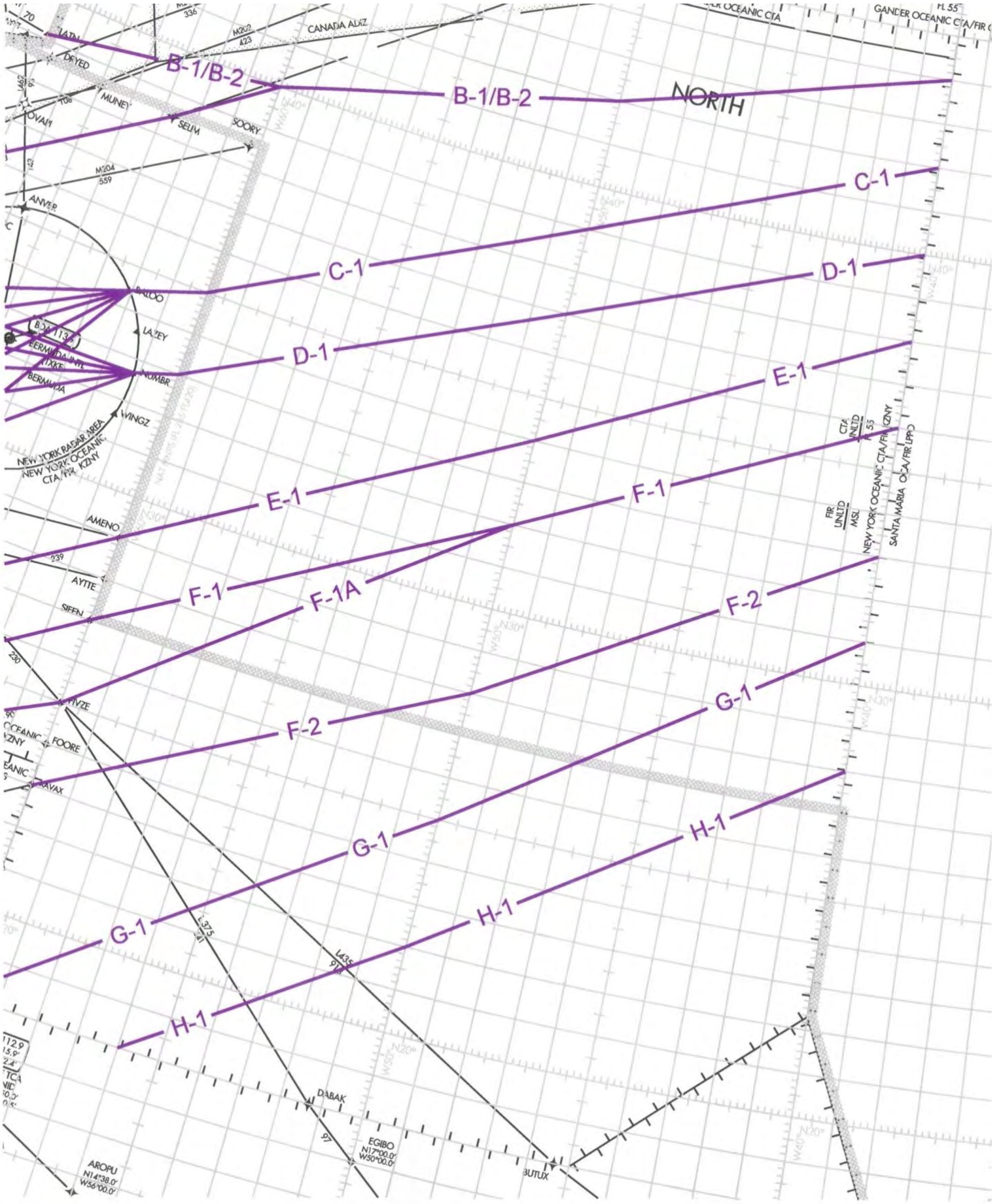
Santa Maria ACC (LPAZ) Telephone/Facsimile Numbers:		
LPAZ Santa Maria ACC	+351-296-820-438	
LPAZ Santa Maria ACC (satellite link)	+351-296-886-042	
LPAZ Atlantic Operations Director	+351-296-820-501	
LPAZ Operations Division Manager	+351-296-820-501	
LPAZ ATC Operations Manager	+351-296-820-508	
LPAZ Radio Station Manager	+351-296-820-509	
LPAZ ACC Watch Manager	+351-296-820-400	
LPAZ ACC Watch Manager	+351-296-886-299	+351-296-820-422
LPAZ Radio Station Watch Manager	+351-296-820-401	
Lajes RCC	+351-295-540-515	
Lajes RCC	+351-295-513-686	+351-295-540-792

Appendix 4A-1

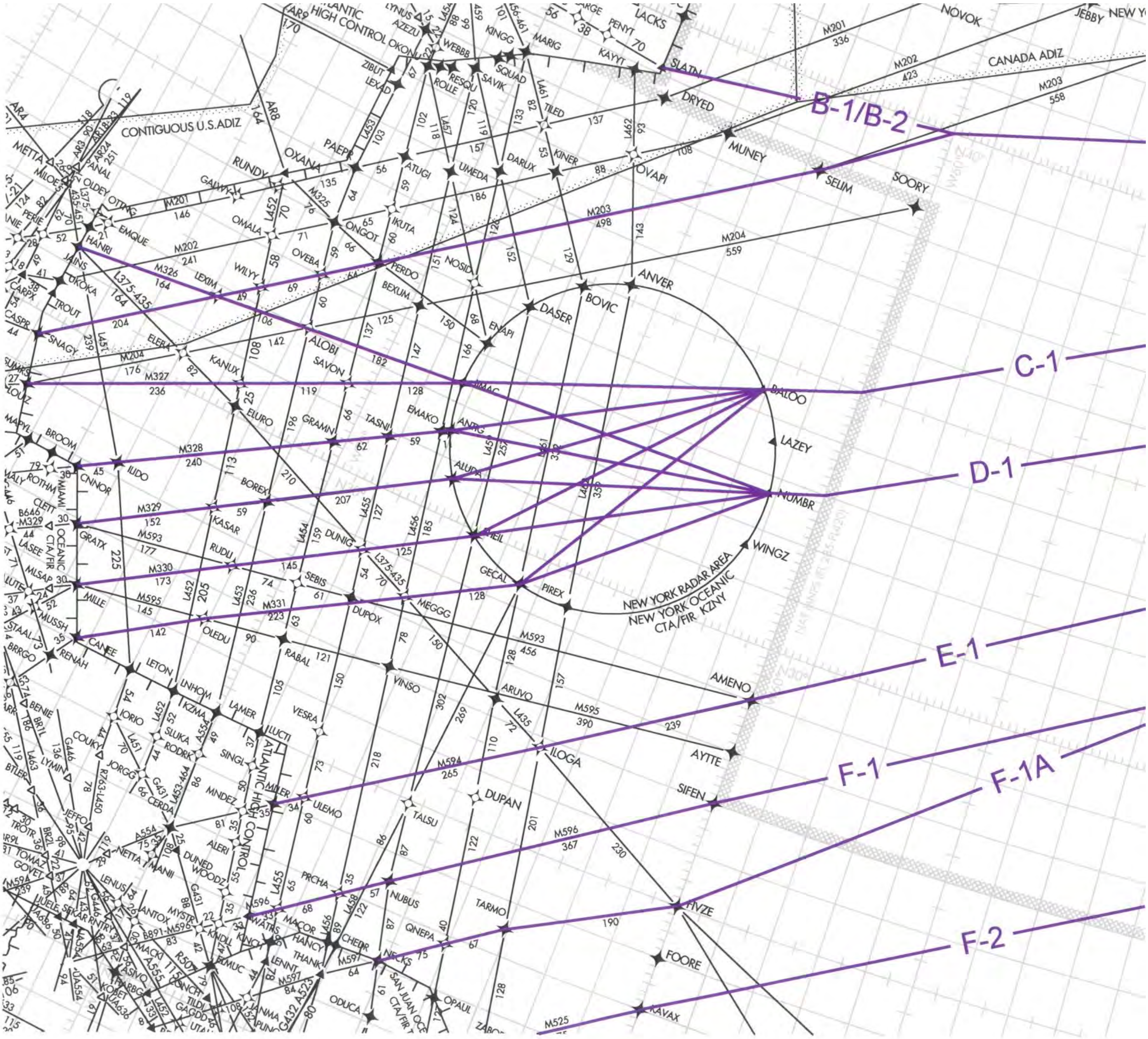
Routes (B-1, [M203toB-2], [M326, M327, M328, M329, M330, M331toC-1], [M326, M327, M328, M329, M330, M331toD-1], [M594toE-1], [M596toF-1], [M597toF-1A], F-2, G-1, H-1) Pictorial



Appendix 4A-2
Routes (B-1, B-2, C-1, D-1, E-1, F-1, F-1A, F-2, G-1, H-1) Pictorial



Appendix 4A-3
Routes (B-1, [M203toB-2], [M326,M327,M328,M329,M330,M331toC-1], [M326,M327,M328,M329,M330,M331toD-1], [M594toE-1], [M596toF-1], [M597toF-1A], F-2, G-1, H-1) Pictorial



Appendix 5 –

Contingency Procedures between NY OAC and Piarco ACC

Upon notification that NY OAC has lost its ability to provide air traffic control service, Piarco ACC will reroute traffic to avoid entry into ZNY airspace.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the following routes.

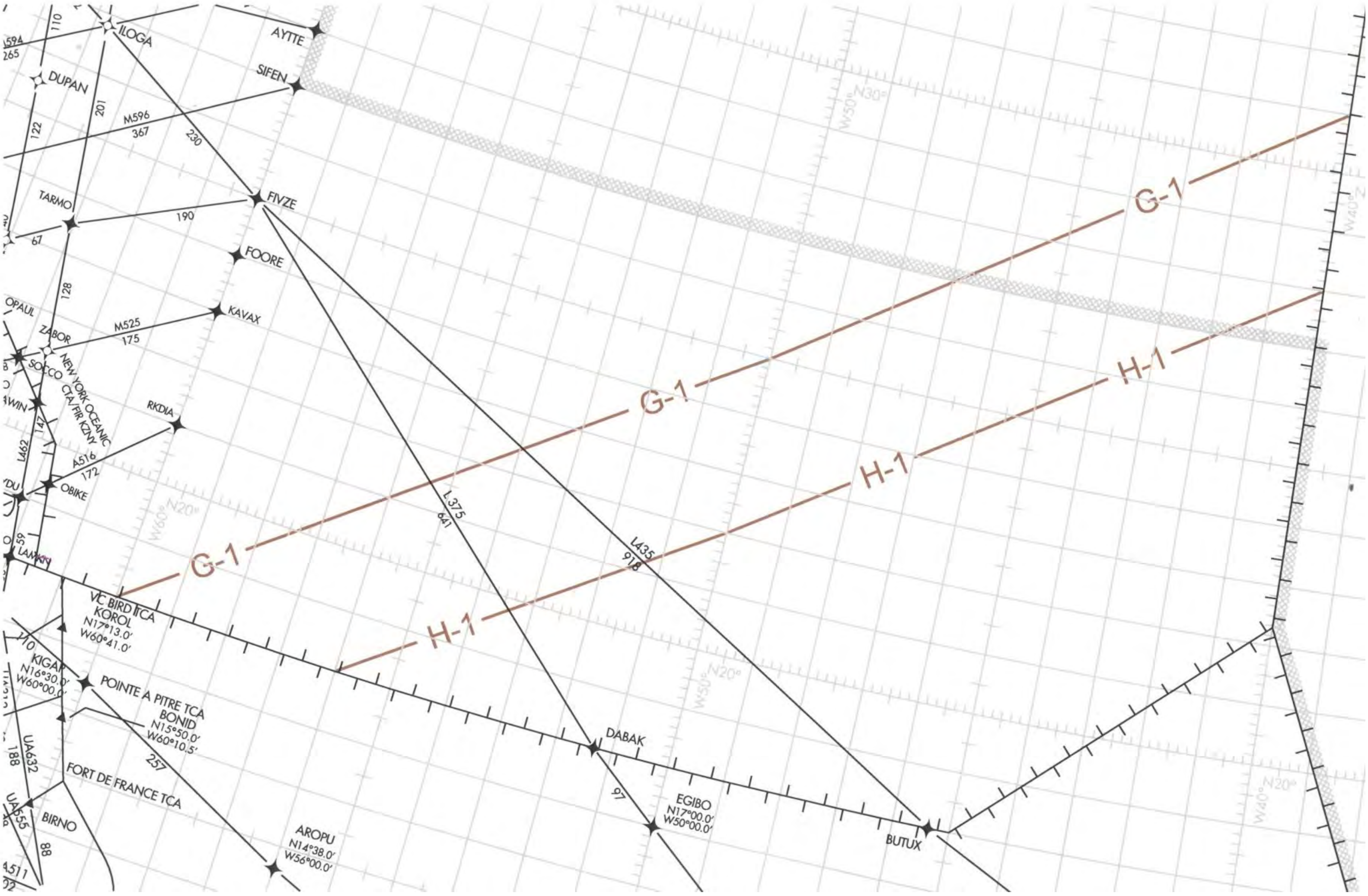
Rte Name	Route Definition (See Pictorial - Appendix 5A-1/2)	Altitudes
G-1	1800N/06000W 2500N/05000W 3100N/04000W FPR (and the reverse)	any useable altitude
H-1	1800N/05600W 2200N/05000W 2800N/04000W FPR (and the reverse)	any useable altitude

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

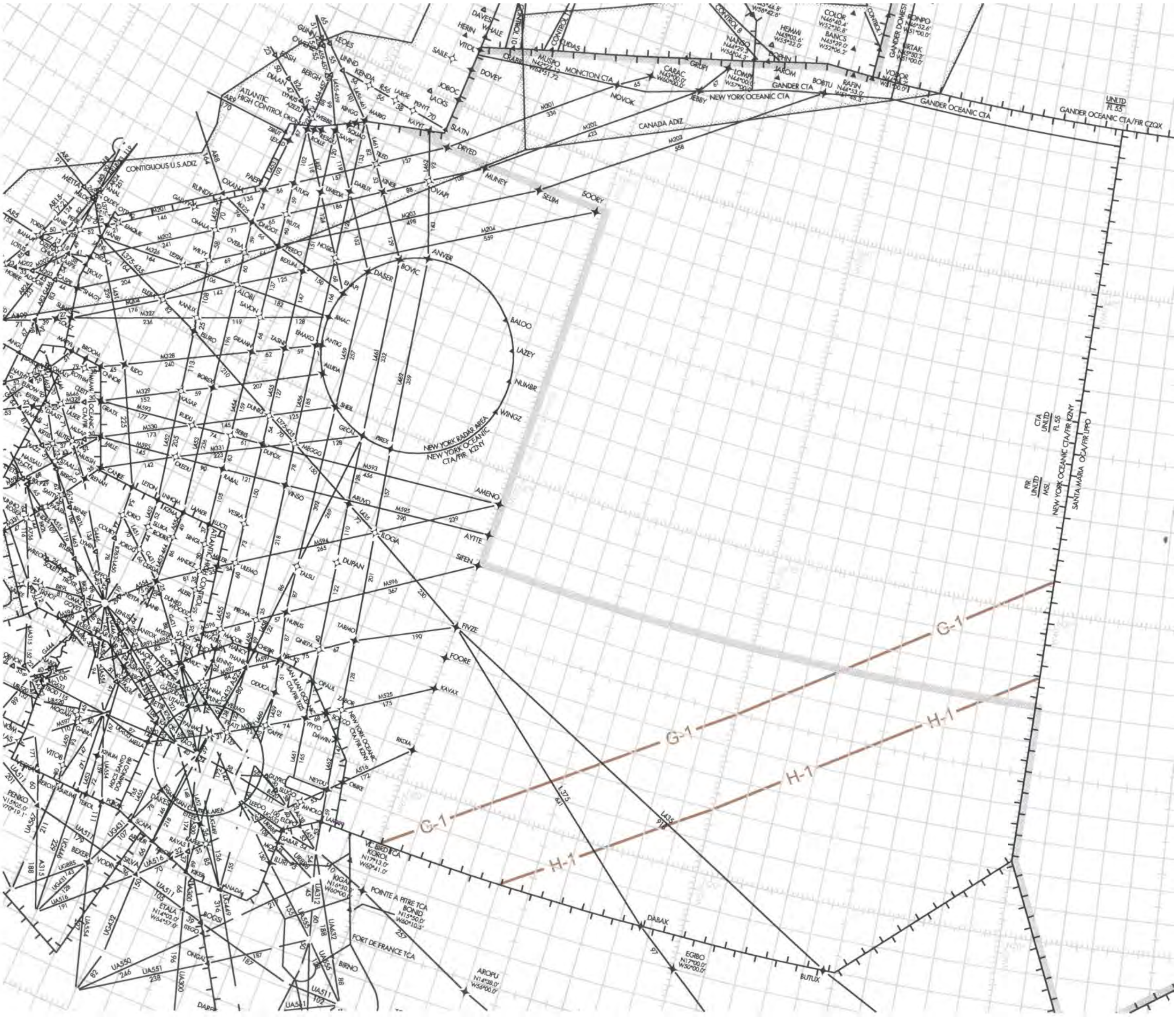
New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax:+1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

Piarco ACC Telephone/Facsimile Numbers:		
Piarco Control Room	+868-669-6181	Fax: +868-669-1716
Piarco Control Room	+868-669-4852	

Appendix 5A-1 - Routes (G-1, H-1) Pictorial



Appendix 5A-2 - Routes (G-1, H-1) Pictorial



Appendix 6 –

Contingency Procedures between NY OAC and San Juan CERAP

Upon notification that NY OAC has lost its ability to provide air traffic control service, San Juan CERAP will reroute northbound traffic that is flight planned to enter NY OAC airspace through Miami ARTCC, and northeast bound traffic through Piarco ACC.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the following routes.

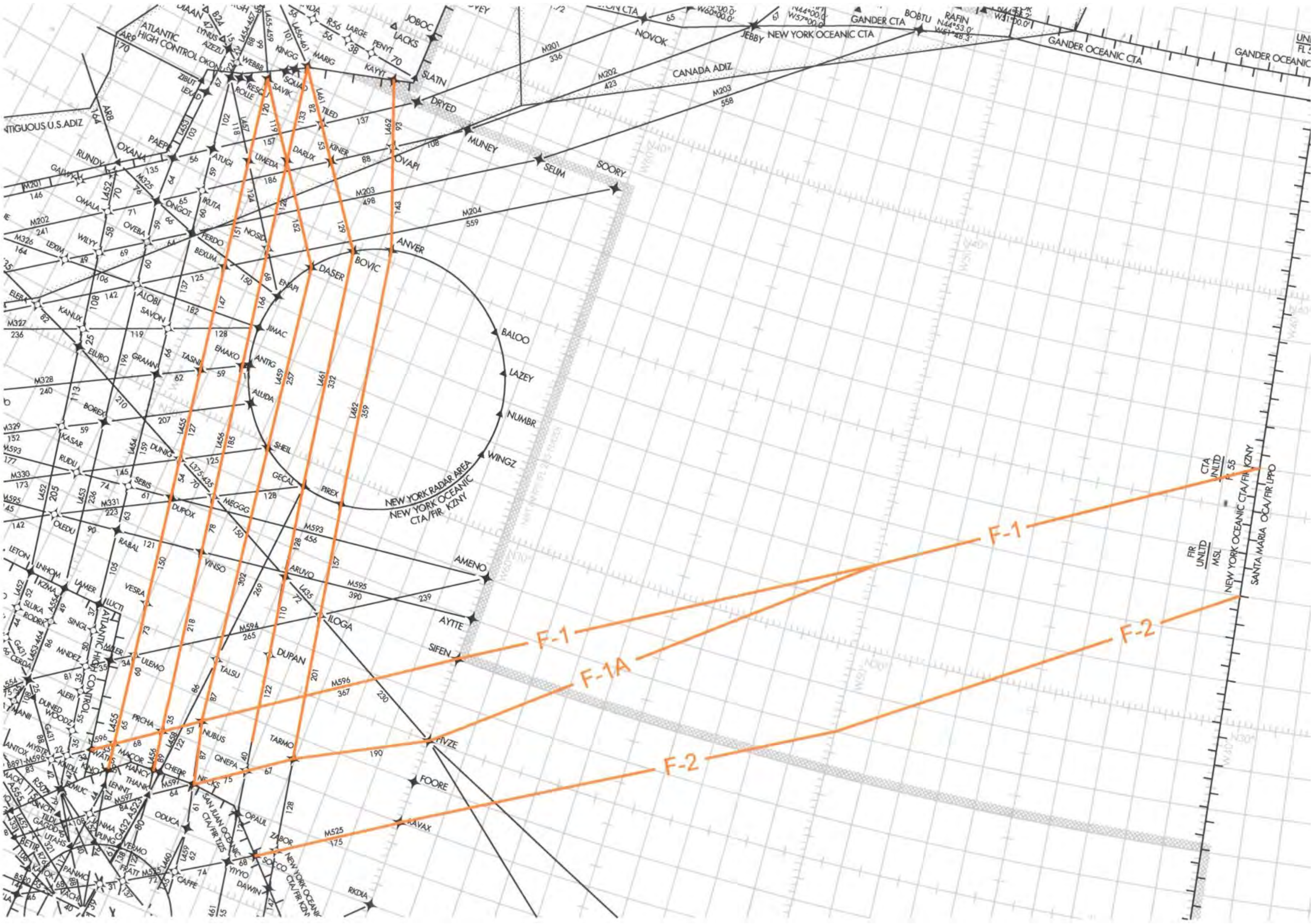
Rte Name	Route Definition (See Pictorial - Appendix 6A)	Altitudes
L455	SAVIK L455 KINCH FPR (and the reverse)	FL300 to FL350
L456	MARIG L456 HANCY FPR (and the reverse)	FL300 to FL350
L459	SAVIK L459 NECKS FPR (and the reverse)	FL290 or below to DASER, then FL300 to FL350
L461	MARIG L461 OPAUL FPR (and the reverse)	FL290 and below to BOVIC, then FL300 to FL350
L462	KAYYT L462 DAWIN FPR (and the reverse)	FL350 and below to ANVER, then FL300 to FL350
M596 then F-1 after SIFEN	NUBUS M596 SIFEN 3200N/05000W 3600N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
M597 then F-1A after FIVZE	NECKS M597 FIVZE 3200N/05000W 3600N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
F-2	SOCCO M525 KAVAX 2800N/05000W 3300N/04000W FPR (and the reverse)	any useable altitude

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

San Juan (ZSU) OAC Telephone/Facsimile Numbers:		
ZSU Watch Supervisor	+1-787-253-8664	Fax: +1-787-253-8685
ZSU Watch Supervisor	+1-787-253-8665	
ZSU Watch Supervisor	+1-787-253-8648	
ZSU Watch Supervisor (Satellite Phone)	..888-570-3278	

Appendix 6A
Routes (L455, L456, L459, L461, L462, [M596toF-1], [M597to F-1A], F-2) Pictorial



Appendix 7 –

Contingency Procedures between NY OAC and Miami ARTCC

Upon notification that NY OAC has lost its ability to provide air traffic control service, Miami ARTCC will reroute traffic that is flight planned to enter ZNY airspace through Jacksonville ARTCC.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the following routes listed in

Rte Name	Route Definition (See Pictorial - Appendix 7A-1/2/3)	Altitudes
L454	OKONU L454 LUCTI FPR (and the reverse)	FL300 to FL350
L453	AZEZU L453 LAMER FPR (and the reverse)	FL300 to FL350
L452	OXANA L452 LNHOM FPR (and the reverse)	FL300 to FL350
L451	JAINS L451 LETON FPR (and the reverse)	FL300 to FL350
M203	SNAGY M203 BOBTU FPR (and the reverse)	FL360 and above
M203 then B-2 after SELIM	SNAGY M203 SELIM 40000N/06000W 42000N/05000w 4400N/04000W FPR (and the reverse)	FL360 and above
M327 then C-1 after BALOO	SUMRS M327 JIMAC BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below to JIMAC, then any useable altitude
M327 then D-1 after NUMBR	SUMRS M327 JIMAC NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below to JIMAC, then any useable altitude
M328 then C-1 after BALOO	CNNOR M328 ANTIG BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above to ANTIG, then any useable altitude
M328 then D-1 after NUMBER	CNNOR M328 ANTIG NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above to ANTIG, then any useable altitude
M329 then C-1 after BALOO	GRATX M329 ALUDA BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
M329 then D-1 after NUMBR	GRATX M329 ALUDA NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
M330 then C-1 after BALOO	MILLE M330 SHEIL BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
M330 then D-1 after NUMBR	MILLE M330 SHEIL NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
M331 then C-1 after BALOO	CANEE M331 GECAL BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above
M331 then D-1 after NUMBR	CANEE M331 GECAL NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below, or FL360 and above

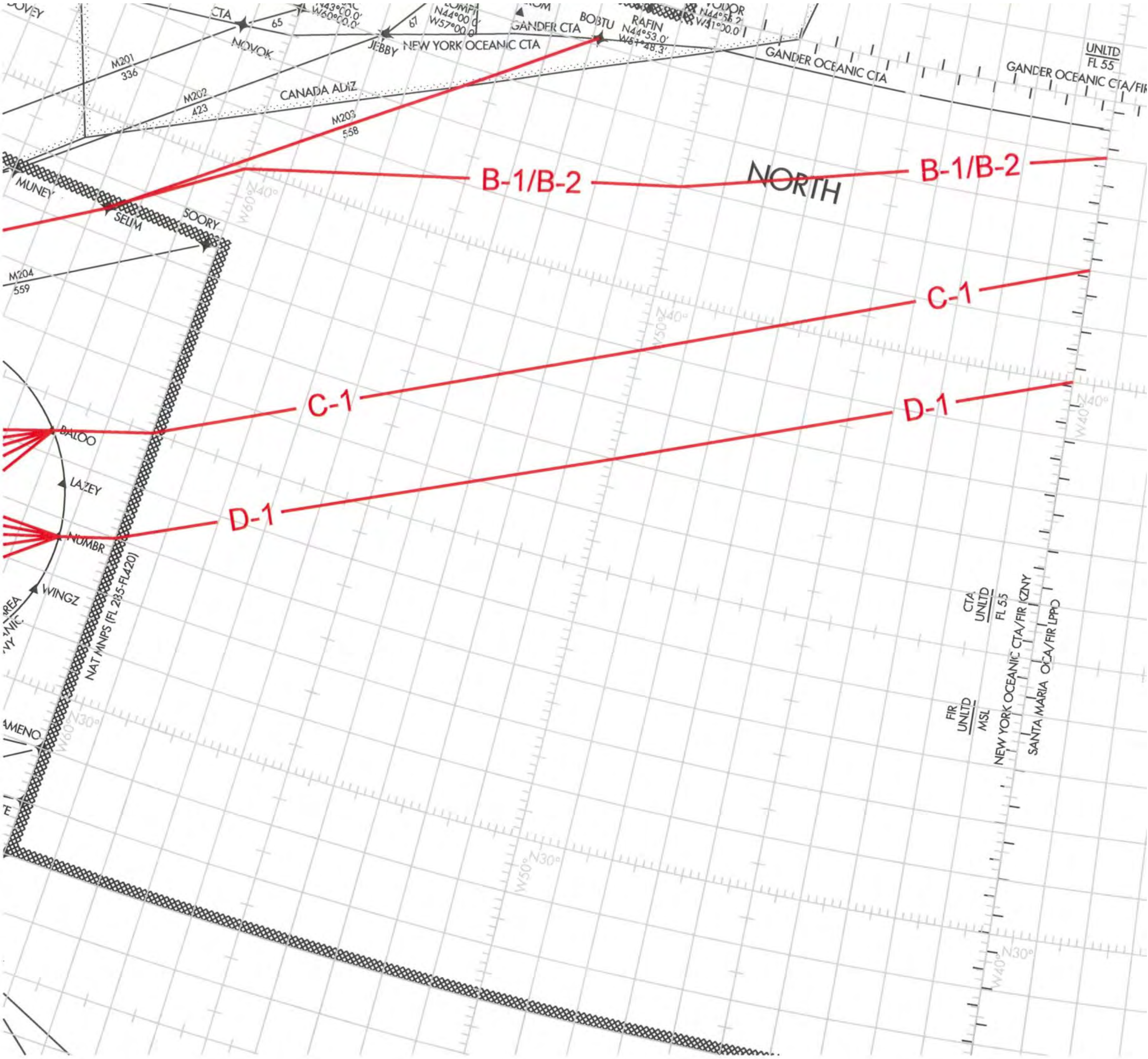
Appendix 7-2

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

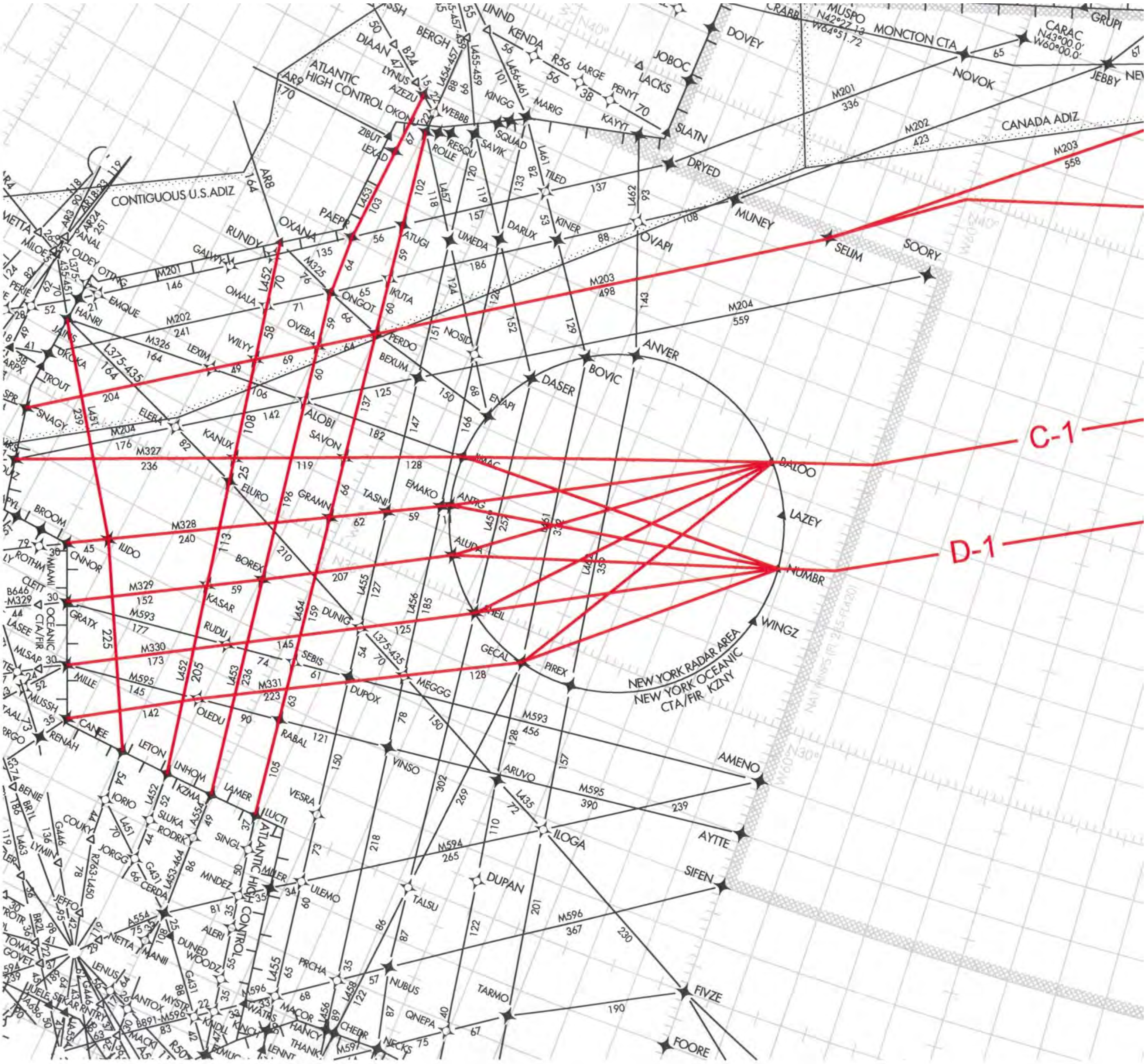
Miami Center (ZMA) Telephone/Facsimile Numbers:		
ZMA Watch Desk	+1-305-716-1588	Fax: +1-305-716-1511/1613
ZMA Traffic Management Unit	+1-305-716-1736	Fax: +1-305-716-1777
ZMA Traffic Management Officer	+1-305-716-1591	Fax: +1-035-716-1777
ZMA Airspace and Procedures	+1-305-716-1547	
ZMA Tech Ops	+1-305-716-1204	Fax: +1-305-716-1293

Appendix 7A-1
Routes (B-2, C-1, D-1) Pictorial



Appendix 7A-2

Routes (L454, L453, L452, L451, M203, [M203toB-2], [M327,M328,M329,M330,M331toC-1], [M327,M328,M329,M330,M331toD-1]) Pictorial



Appendix 8 –

Contingency Procedures between NY OAC and Jacksonville ARTCC

Upon notification that NY OAC has lost its ability to provide air traffic control service, Jacksonville ARTCC will reroute traffic that is flight planned to enter ZNY airspace, depending on its original route, northward into Washington ARTCC airspace, or southward into Miami ARTCC airspace.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the following routes.

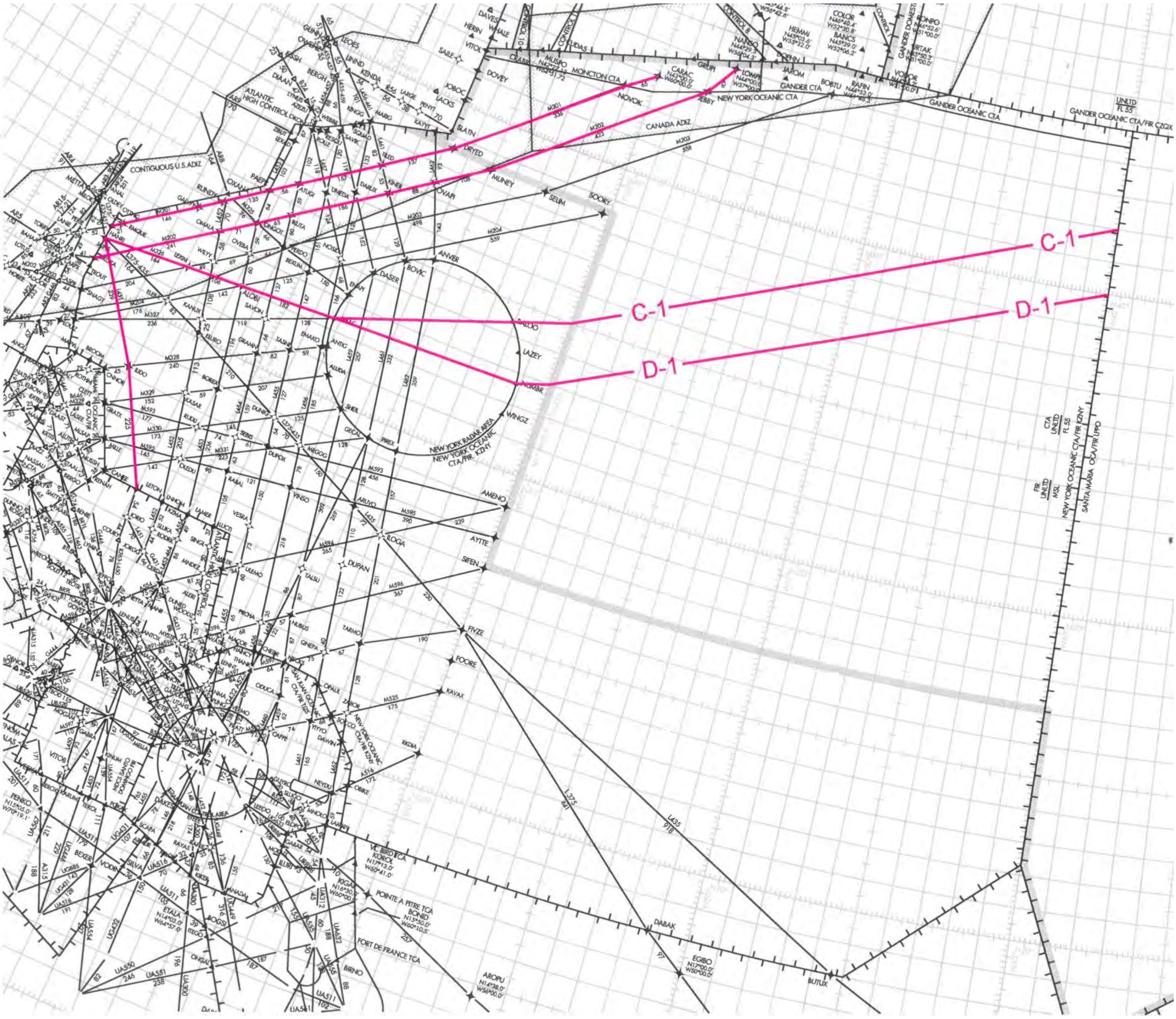
Rte Name	**Route Definition (See Pictorial - Appendix 8A-1/2/3)**	**Altitudes**
M201	HANRI M201 CARAC FPR (and the reverse)	FL360 and above
M326 then C-1 after BALOO	JAINS M326 JIMAC BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)	FL290 and below to JIMAC, then any useable altitude
M326 then D-1 after NUMBR	JAINS M326 JIMAC NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)	FL290 and below to JIMAC, then any useable altitude
L451	JAINS L451 LETON FPR (and the reverse)	FL300 to FL350
M202	UKOKA M202 JEBBY FPR (and the reverse)	FL360 and above

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

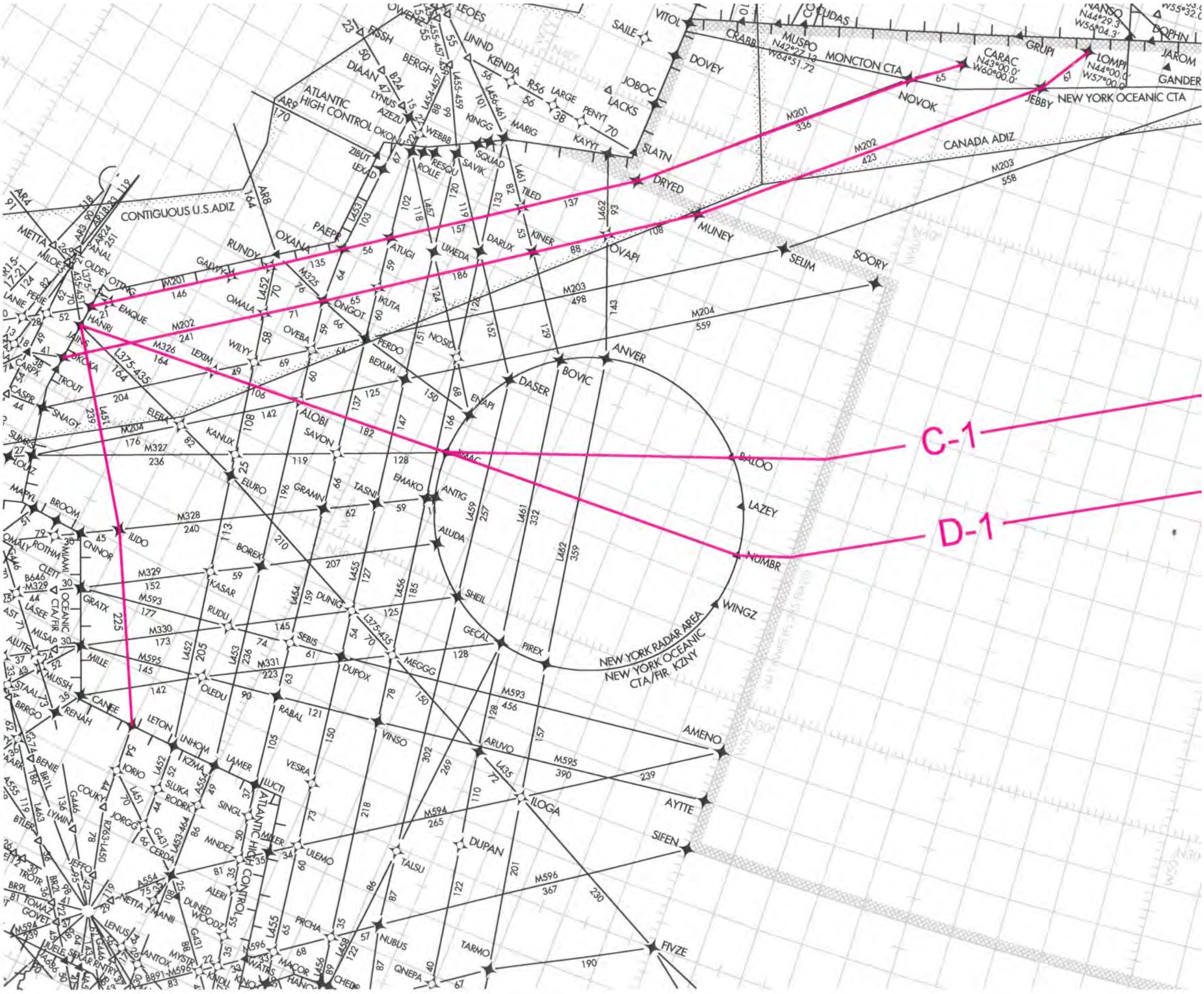
Jacksonville Center (ZJX) Telephone/Facsimile Numbers:		
ZJX Watch Desk	+1-904-549-1537	Fax: +1-904-549-1843
ZJX Area 2 – North Area	+1-904-549-1546	Fax: +1-904-549-1843
ZJX Traffic Management Unit	+1-904-549-1542	Fax: +1-904-549-1843
ZJX Airspace and Procedures Office	+1-904-549-1574	Fax: +1-904-549-1803
ZJX Traffic Management Officer	+1-904-549-1538	Fax: +1-904-549-1843
ZJX Tech Ops	+1-904-549-1604	Fax: +1-904-549-1695

Appendix 8A-1
Routes (L451, M201, M202, [M326toC-1], [M326toD-1]) Pictorial



Appendix 8A-2
Routes (C-1, D-1) Pictorial

Appendix 8A-3
Routes (L451, M201, M202, [M326toC-1], [M326toD-1]) Pictorial



Appendix 9 –

Contingency Procedures between NY OAC and Fleet Area Control and Surveillance Facility, Virginia Capes (at to below FL230 only)

Upon notification that NY OAC has lost its ability to provide air traffic control service, Fleet Area Control and Surveillance Facility, Virginia Capes will reroute traffic that is flight planned to enter ZNY airspace to remain clear of the affected airspace.

Implementation of Limited Service

When NY OAC becomes capable of providing limited ATC service, it will be provided to aircraft on the routes listed.

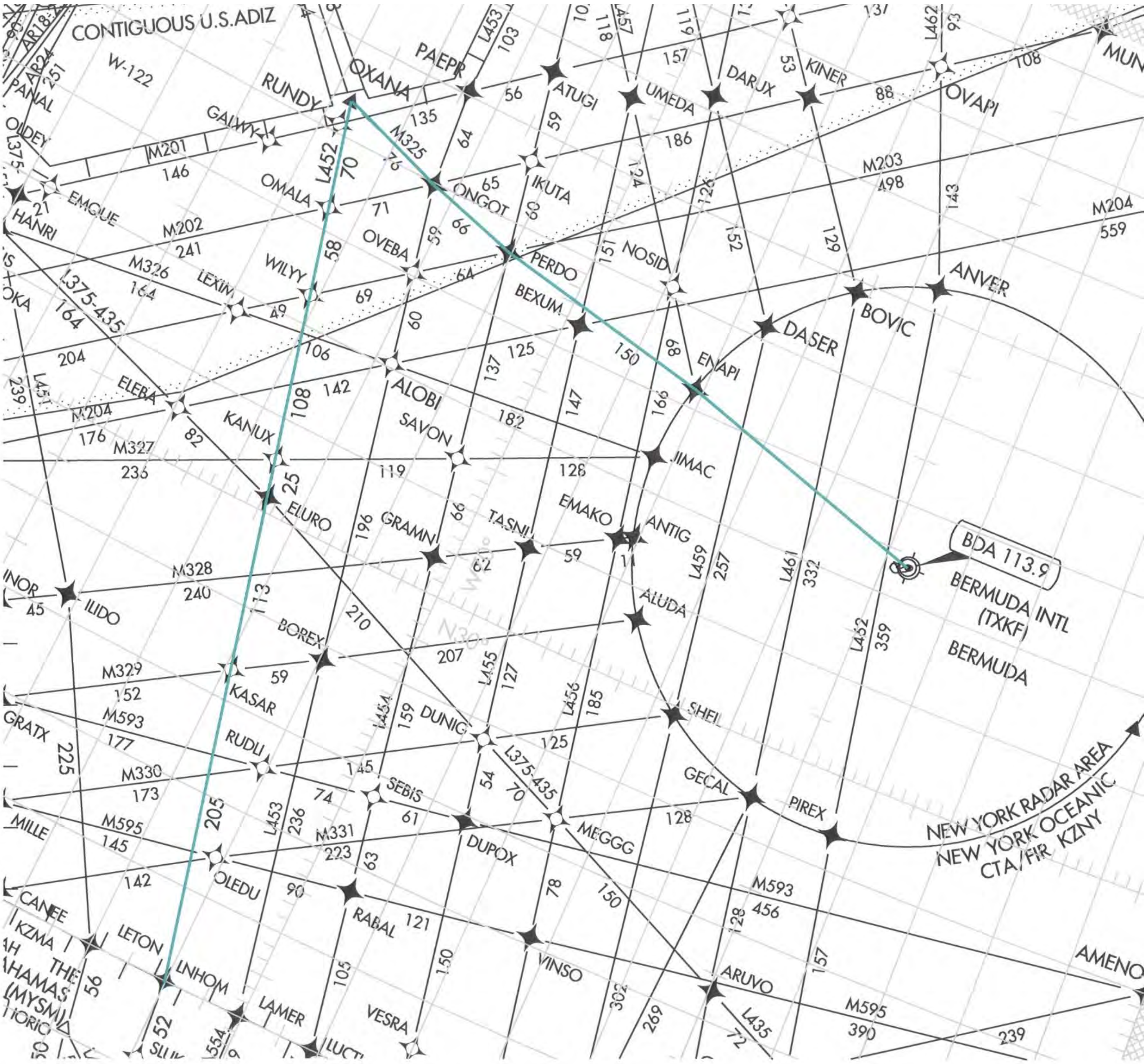
Rte Name	Route Definition (See Pictorial - Appendix 9A-1/2)	Altitudes
M325	OXANA M325 ENAPI TXKF (and the reverse)	FL230 and below
L452	OXANA L452 LNHOM FPR (and the reverse)	FL230 and below

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

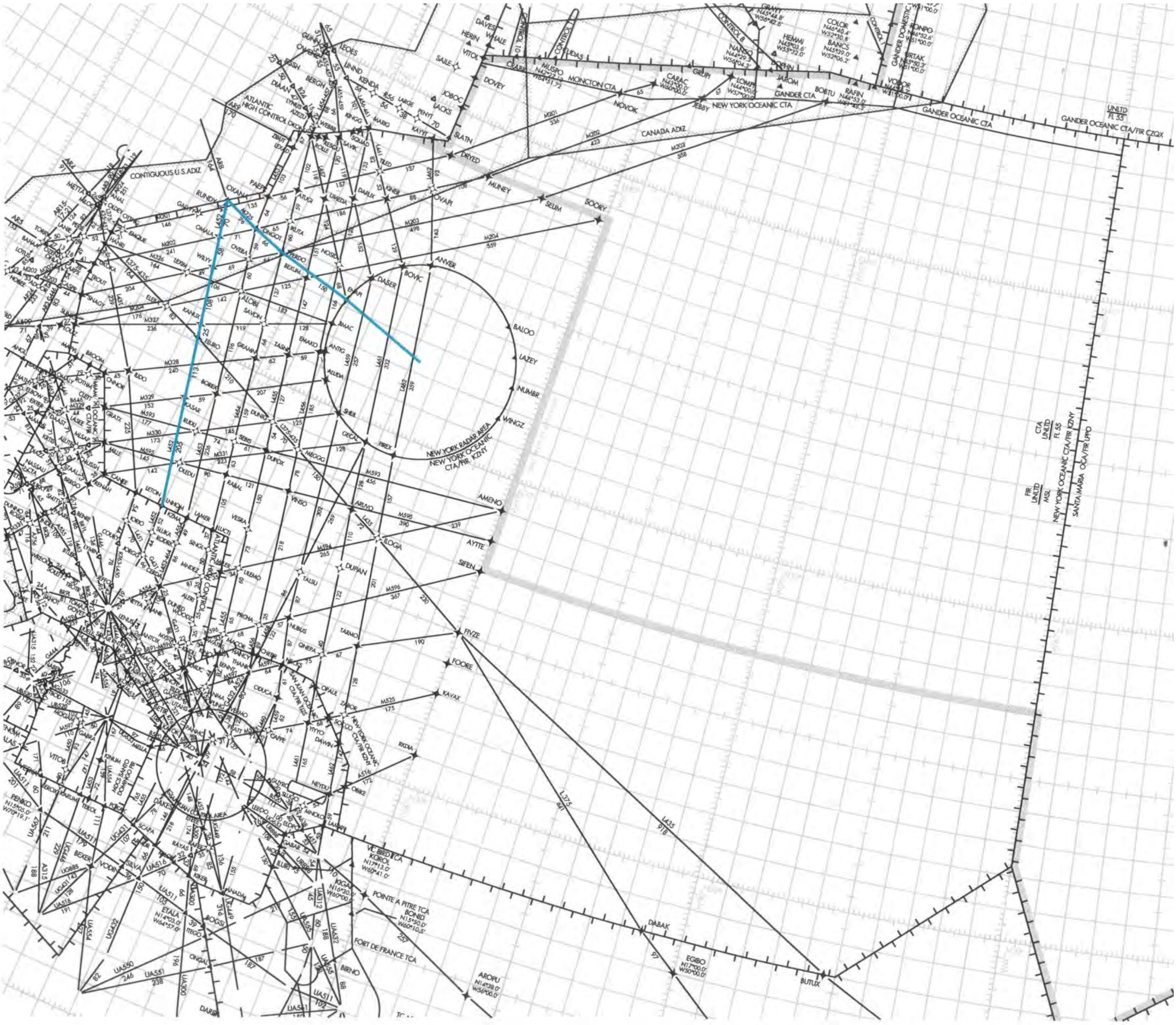
New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

Fleet Area Control and Surveillance Facility, Virginia Capes Telephone/Facsimile Numbers:		
Control Room Supervisor	+1-757-433-1230	Fax: +1-757-433-1266/1209
Control Room Supervisor	+1-757-433-1231	Fax: +1-757-433-1266/1209
Airspace Officer	+1-757-433-1248	
Airspace Chief Petty Officer	+1-757-433-1225	

Appendix 9A-1
Routes (M325, L452) Pictorial



Appendix 9A-2
Routes (M325, L452) Pictorial



Appendix 10 –

NY OAC FIR Contingency Routes (East / West)

Rte Name	Route Definition
A-1	DOVEY 4200N/06000W 4400N/05000W 4600N/04000W FPR (and the reverse)
B-1	SLATN 4000N/06000W 4200N/05000W 4400N/04000W FPR (and the reverse)
M201	HANRI M201 CARAC FPR (and the reverse)
M326 then C-1 after BALOO	JAINS M326 JIMAC BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)
M326 then D-1 after NUMBR	JAINS M326 JIMAC NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)
M202	UKOKA M202 LOMPI FPR (and the reverse)
M203	SNAGY M203 BOBTU FPR (and the reverse)
M203 then B-2 after SELIM	SNAGY M203 SELIM 4000N/06000W 4200/N05000W 4400N/04000W FPR (and the reverse)
M327 then C-1 after BALOO	SUMRS M327 JIMAC BALOO 3500/N06000W 3900N/05000W 4200N/04000W FPR (and the reverse)
M327 then D-1 after NUMBR	SUMRS M327 JIMAC NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)
M328 then C-1 after BALOO	CNNOR M328 ANTIG BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)
M328 then D-1 after NUMBR	CNNOR M328 ANTIG NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)
M329 then C-1 after BALOO	GRATX M329 ALUDA BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)
M329 then D-1 after NUMBR	GRATX M329 ALUDA NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)
M330 then C-1 after BALOO	MILLE M330 SHEIL BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)
M330 then D-1 after NUMBR	MILLE M330 SHEIL NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)
M331 then C-1 after BALOO	CANEE M331 GECAL BALOO 3500N/06000W 3900N/05000W 4200N/04000W FPR (and the reverse)
M331 then D-1 after NUMBR	CANEE M331 GECAL NUMBR 3300N/06000W 3700N/05000W 4000N/04000W FPR (and the reverse)
M594 then E-1 after AMENO	MLLER M594 AMENO 3400N/05000W 3800N/04000W FPR (and the reverse)
M596 then F-1 after SIFEN	WATRS M596 SIFEN 3200N/05000W 3600N/04000W FPR (and the reverse)
M597 then F-1A after FIVZE	NECKS M597 FIVZE 3200N/05000W 3600N/04000W FPR (and the reverse)
F-2	SOCCO M525 KAVAX 2800N/05000W 3300N/04000W FPR (and the reverse)
G-1	1800N/06000W 2500N/05000W 3100N/04000W FPR (and the reverse)
H-1	1800N/05600W 2200N/05000W 2800N/04000W FPR (and the reverse)

Appendix 10-2

NY OAC FIR Contingency Routes (North / South)

Rte Name	Route Definition
L451	JAINS L451 LETON FPR (and the reverse)
L452	OXANA L452 LNHOM FPR (and the reverse)
L453	AZEZU L453 LAMER FPR (and the reverse)
L454	OKONU L454 LUCTI FPR (and the reverse)
L455	SAVIK L455 KINCH FPR (and the reverse)
L456	MARIG L456 HANCY FPR (and the reverse)
L459	SAVIK L459 NECKS FPR (and the reverse)
L461	MARIG L461 OPAUL FPR (and the reverse)
L462	KAYYT L462 DAWIN FPR (and the reverse)

NY OAC FIR UNAVAILABLE Routes (any direction)

UNAVAILABLE Routes
L375
L435
L457
L458
M593
M595

If, during the provision of limited service, NY OAC becomes capable of increasing air traffic services, more routes and/or increased capacity will be made available to operators.

New York (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax+1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

Appendix 11 –

Contingency Procedures between NY OAC and the

Air Traffic Control System Command Center

Upon notification by the New York Center that its oceanic operation has been impacted to the point where either no service or only limited service is available, the Command Center shall undertake the following actions:

1. Advise all affected ANSPs, flow units and operators of the contingency and the level of service available.

2. Manage and coordinate capacity limitations and associated restrictions, airway usage and altitude availability procedures.

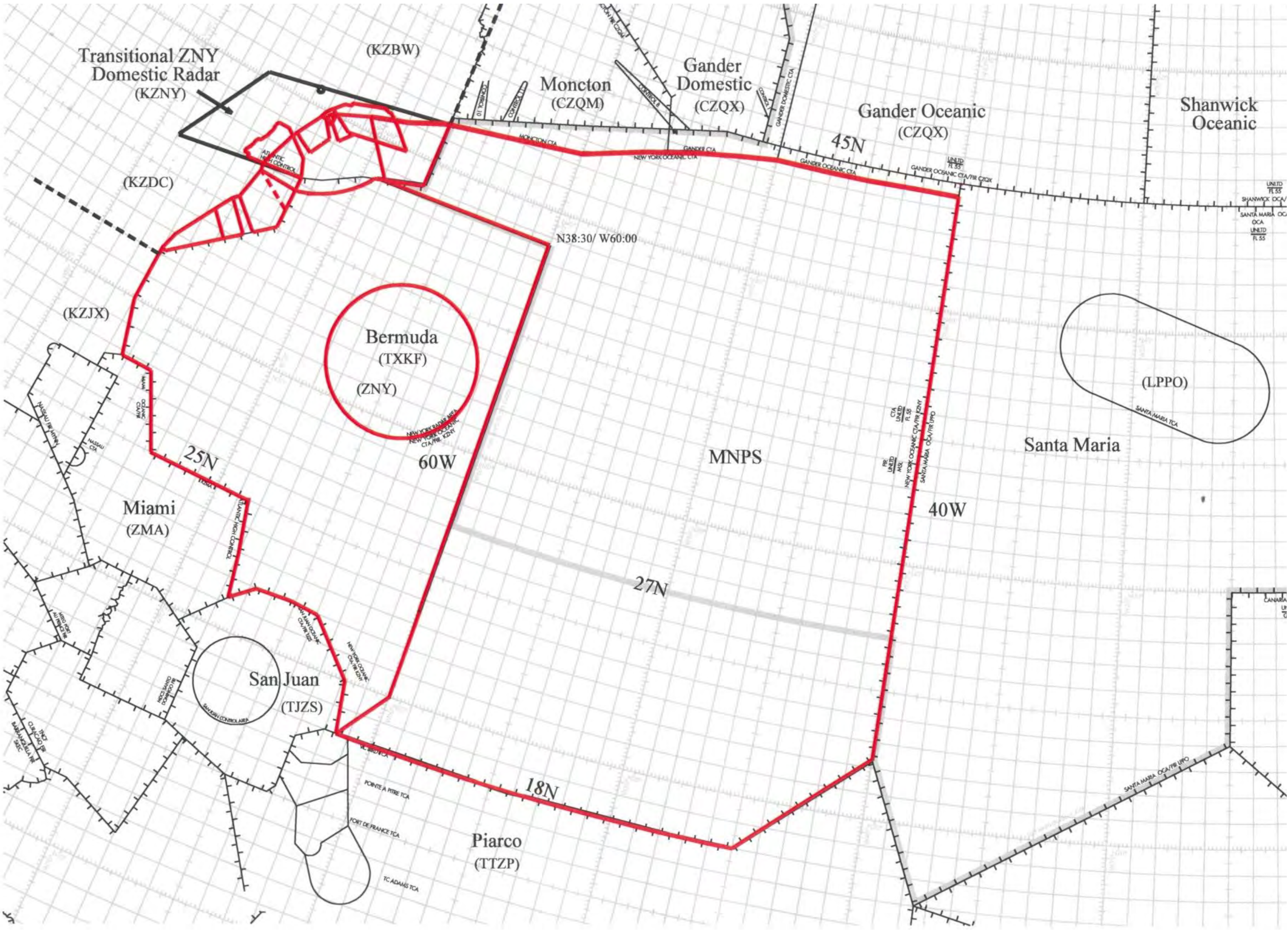
Appendix 12 –

Evacuation Message

Emergency evacuation of New York OAC is in progress. No IFR control or communication will be provided by New York OAC. HF communication is still possible with New York Radio, ADS equipped aircraft must provide position reporting via HF. Use extreme caution and monitor this frequency, emergency frequencies and air to air frequencies. As appropriate: eastbound flights contact Santa Maria ACC, Gander ACC or Moncton ACC, westbound flights contact PIARCO ACC, San Juan CERAP, Miami Center, Jacksonville Center, Fleet Area Control and Surveillance Facility-Virginia Capes, Boston Center, Moncton ACC or Gander ACC. Aircraft not in receipt of an oceanic clearance should expect to land at an appropriate aerodrome, or request appropriate re-clearance to avoid New York OAC. All flights should contact New York ARINC, Santa Maria Radio, or Shanwick Radio as soon as possible. Please broadcast this message on HF, 123.45, 121.5 and 243.0.

Appendix 13 –

Adjacent Agencies



Appendix 14 –

Adjacent Agencies Communications

Westbound via	**Facility to contact**	**Frequencies**
DOVEY	N.Y. Center (ZNY)	125.925 / 284.75
JOBOC	N.Y. Center (ZNY)	125.925 / 284.75
SLATN	N.Y. Center (ZNY)	125.925 / 284.75

North or Northwest bound via	**Facility to contact**	**Frequencies**
KAYYT	N.Y. Center (ZNY)	125.925 / 284.75
MARIG	N.Y. Center (ZNY)	133.5 / 354.0
SAVIK	N.Y. Center (ZNY)	133.5 / 354.0
OKONU	N.Y. Center (ZNY)	133.5 / 354.0

Inbound to Bermuda airspace via	**Facility to contact**	**Frequencies**
BALOO	N.Y. Center (ZNY)	128.5 / 239.0
NUMBR	N.Y. Center (ZNY)	128.5 / 239.0
LAZEY	N.Y. Center (ZNY)	128.5 / 239.0
WINGZ	N.Y. Center (ZNY)	128.5 / 239.0
PIREX	N.Y. Center (ZNY)	128.5 / 239.0
GECAL	N.Y. Center (ZNY)	128.5 / 239.0
SHEIL	N.Y. Center (ZNY)	128.5 / 239.0
ALUDA	N.Y. Center (ZNY)	128.5 / 239.0
ANTIG	N.Y. Center (ZNY)	128.5 / 239.0
JIMAC	N.Y. Center (ZNY)	128.5 / 239.0
ENAPI	N.Y. Center (ZNY)	128.5 / 239.0
DASER	N.Y. Center (ZNY)	128.5 / 239.0
BOVIC	N.Y. Center (ZNY)	128.5 / 239.0
ANVER	N.Y. Center (ZNY)	128.5 / 239.0

North or Westbound via	**Facility to contact**	**Frequencies**
OXANA (FL240 & above)	N.Y. Center (ZNY)	126.025 / no UHF
OXANA (FL230 & below)	Giant Killer (VACAPES)	135.875 / 251.6
JAINS (FL380 and above)	Jacksonville Center (ZJX)	120.125 / 381.45
JAINS (FL370 and below)	Jacksonville Center (ZJX)	135.05 / 307.05
UKOKA (FL380 and above)	Jacksonville Center (ZJX)	120.125 / 381.45
UKOKA (FL370 and below)	Jacksonville Center (ZJX)	135.05 / 307.05

Appendix 14-2
Adjacent Agencies Communications

South or Southwest bound via	Facility to contact	Frequencies
SNAGY	Miami Center (ZMA)	123.67 / no UHF
SUMRS	Miami Center (ZMA)	123.67 / no UHF
MAPYL	Miami Center (ZMA)	134.8 / 298.9
CONNR	Miami Center (ZMA)	134.8 / 298.9
GRATX	Miami Center (ZMA)	134.8 / 298.9
MILLE	Miami Center (ZMA)	126.27 / 251.12
CANEE	Miami Center (ZMA)	126.27 / 251.12
LETON	Miami Center (ZMA)	135.2 / 327.0
LNHOM	Miami Center (ZMA)	135.2 / 327.0
LAMER	Miami Center (ZMA)	135.2 / 327.0
LUCTI	Miami Center (ZMA)	135.2 / 327.0
MLLER	Miami Center (ZMA)	135.2 / 327.0

Southbound via	Facility to contact	Frequencies
KINCH	San Juan CERAP (TJZS)	134.3/307.0
HANCY	San Juan CERAP (TJZS)	134.3/307.0
NECKS	San Juan CERAP (TJZS)	134.3/307.0
OPAUL	San Juan CERAP (TJZS)	125.0/285.5
DAWIN	San Juan CERAP (TJZS)	125.0/285.5
LAMKN	Piarco Center (TTZP)	123.7 / no UHF
North or Northeast bound via	**Facility to contact**	**Frequencies**
NOVOK	Moncton ACC (ZQM)	125.25 / no UHF
JEBBY	Moncton ACC (ZQM)	125.25 / no UHF
BOBTU	Gander ACC (ZQX)	134.7 / no UHF

ARINC HF Frequency Families			
NAT Region HF Frequencies		**WATRS Region HF Frequencies**	
2962 -QE	11309 -XE	2887 -QE	8846 -VF
3016 -QA	13306 -YA	3455 -CS	8918 -VQ
5598 -TA	13354 -YE	5520 -EN	11330 -LS
6628 -TE	17952 -ZE	5550 -TL	11396 -XO
8825 -VE	21964 -PN	6577 -UI	13297 -YG
8906 -VA		6586 -UJ	17907 -ZD
N.Y. U.S.A., Area VHF 129.9 -JW		San Juan, PR, Area VHF 130.7 -KA	

Appendix 14-3
Adjacent Agencies Communications

Gander Radio HF Frequencies									
Family	Frequency bands								
	3 MHz	3.5 MHz	4.7 MHz	5.6 MHz	6.6 MHz	9 MHz	11.3 MHz	13.3 MHz	18 MHz
A	3016			5598		8906		13306	
B	2899			5616		8864		13291	
C	2872			5649		8879	11336	13306	
D	2971		4675			8891	11279		
F		3476			6622	8831		13291	
VOLMET		3485			6604		10051	13270	

Appendix 15 –

Consolidated New York Center Contact Details

New York Center (ZNY) OAC Telephone/Facsimile Numbers:		
ZNY Watch Desk	+1-631-468-5959	Fax: +1-631-468-4224
ZNY Traffic Management Unit	+1-631-468-1080	Fax: +1-631-468-4224
ZNY North Atlantic Operating Area Supvr	+1-631-468-1496/1413	Fax: +1-631-468-4224
ZNY WATRS Operating Area Supvr	+1-631-468-1495	Fax: +1-631-468-4224
ZNY Procedures Office	+1-631-468-1018	Fax: +1-631-468-4229
ZNY Traffic Management Officer	+1-631-468-1010	Fax: +1-631-468-4211
ZNY Technical Operations Area	+1-631-468-1293	Fax: +1-631-468-1289

New York Aeronautical Radio INC. (ARINC) Telephone/Facsimile Numbers:		
ARINC Operation Team Leader	+1-631-589-7272	Fax: +1-631-563-2412
ARINC Shift Manager	+1-631-244-2483	Fax: +1-631-563-2412

Boston Center (ZBW) Telephone/Facsimile Numbers:		
ZBW Watch Desk	+1-603-879-6655	Fax: +1-603-879-6717
ZBW Traffic Management Unit	+1-603-879-6666	Fax: +1-603-879-6717
ZBW Procedures Office	+1-603-879-6858	Fax: +1-603-879-6410
ZBW Traffic Management Officer	+1-603-879-6644	Fax: +1-603-879-6717
ZBW Technical Operations Area	+1-603-879-6729	Fax: +1-603-879-6934

Moncton ACC (YQM) Telephone/Facsimile Numbers:		
Nav Canada National Operations Center	+1-613-248-4087	Fax: +1-613-248-3983
YQM Moncton ACC (at NOVOK or JEBBY)	+1-506-867-7175	Fax: +1-506-867-7180
YQM Moncton ACC (at NOVOK or JEBBY)	+1-506-867-7173	Fax: +1-506-867-7180

Gander ACC (YQX) Telephone/Facsimile Numbers:		
Nav Canada National Operations Center	+1-613-248-4087	Fax: +1-613-248-3983
YQX Gander Shift Manager	+1-709-651-5207	Fax: +1-709-651-5324
YQX Gander Shift Manager	+1-709-651-5203	Fax: +1-709-651-5324
YQX Gander Oceanic Supervisor	+1-709-651-5324	Fax: +1-709-651-5324
Gander Radio Supervisor	+1-709-651-5212	Fax: +1-709-651-5344

Appendix 15-2
Consolidated New York Center Contact Details

Santa Maria (LPAZ) Telephone/Facsimile Numbers:		
LPAZ Santa Maria ACC	+351-296-820-438	
LPAZ Santa Maria ACC (satellite link)	+351-296-886-042	
LPAZ Atlantic Operations Director	+351-296-820-501	
LPAZ Operations Division Manager	+351-296-820-501	
LPAZ ATC Operations Manager	+351-296-820-508	
LPAZ Radio Station Manager	+351-296-820-509	
LPAZ ACC Watch Manager	+351-296-820-400	
LPAZ ACC Watch Manager	+351-296-886-299	Fax: +351-296-820-422
LPAZ Radio Station Watch Manager	+351-296-820-401	
Lajes RCC	+351-295-540-515	
Lajes RCC	+351-295-513-686	Fax: +351-295-540-792

Piarco ACC Telephone/Facsimile Numbers:		
Piarco Control Room	+868-669-6181	Fax: +868-669-1716
Piarco Control Room	+868-669-4852	

San Juan CENRAP (ZSU) Telephone/Facsimile Numbers:		
ZSU Watch Supervisor	+1-787-253-8664	Fax: +1-787-253-8685
ZSU Watch Supervisor	+1-787-253-8665	
ZSU Watch Supervisor	+1-787-253-8648	
ZSU Watch Supervisor (Satellite Phone)	..888-570-3278	

Miami Center (ZMA) Telephone/Facsimile Numbers:		
ZMA Watch Desk	+1-305-716-1588	Fax: +1-305-716-1511/1613
ZMA Traffic Management Unit	+1-305-716-1736	Fax: +1-305-716-1777
ZMA Traffic Management Officer	+1-305-716-1591	Fax: +1-035-716-1777
ZMA Airspace and Procedures	+1-305-716-1547	
ZMA Tech Ops	+1-305-716-1204	Fax: +1-305-716-1293

Appendix 15-3
Consolidated New York Center Contact Details

Jacksonville Center (ZJX) Telephone/Facsimile Numbers:		
ZJX Watch Desk	+1-904-549-1537	Fax: +1-904-549-1843
ZJX Area 2 – North Area	+1-904-549-1546	Fax: +1-904-549-1843
ZJX Traffic Management Unit	+1-904-549-1542	Fax: +1-904-549-1843
ZJX Airspace and Procedures Office	+1-904-549-1574	Fax: +1-904-549-1803
ZJX Traffic Management Officer	+1-904-549-1538	Fax: +1-904-549-1843
ZJX Tech Ops	+1-904-549-1604	Fax: +1-904-549-1695

Fleet Area Control and Surveillance Facility, Virginia Capes Telephone/Facsimile Numbers:		
Control Room Supervisor	+1-757-433-1230	Fax: +1-757-433-1266/1209
Control Room Supervisor	+1-757-433-1231	Fax: +1-757-433-1266/1209
Airspace Officer	+1-757-433-1248	
Airspace Chief Petty Officer	+1-757-433-1225	

FAA Air Traffic Control System Command Center (ATCSCC) Telephone/Facsimile Numbers:		
National Operations Manager (NOM)	+1-703-904-4525	Fax: +1-703-904-4459
International Operations	+1-703-925-3113	Fax: +1-703-904-4461
Strategic Operations	+1-703-904-4402	Fax: +1-703-904-4461

Appendix 16 –

VOLMET International Broadcast

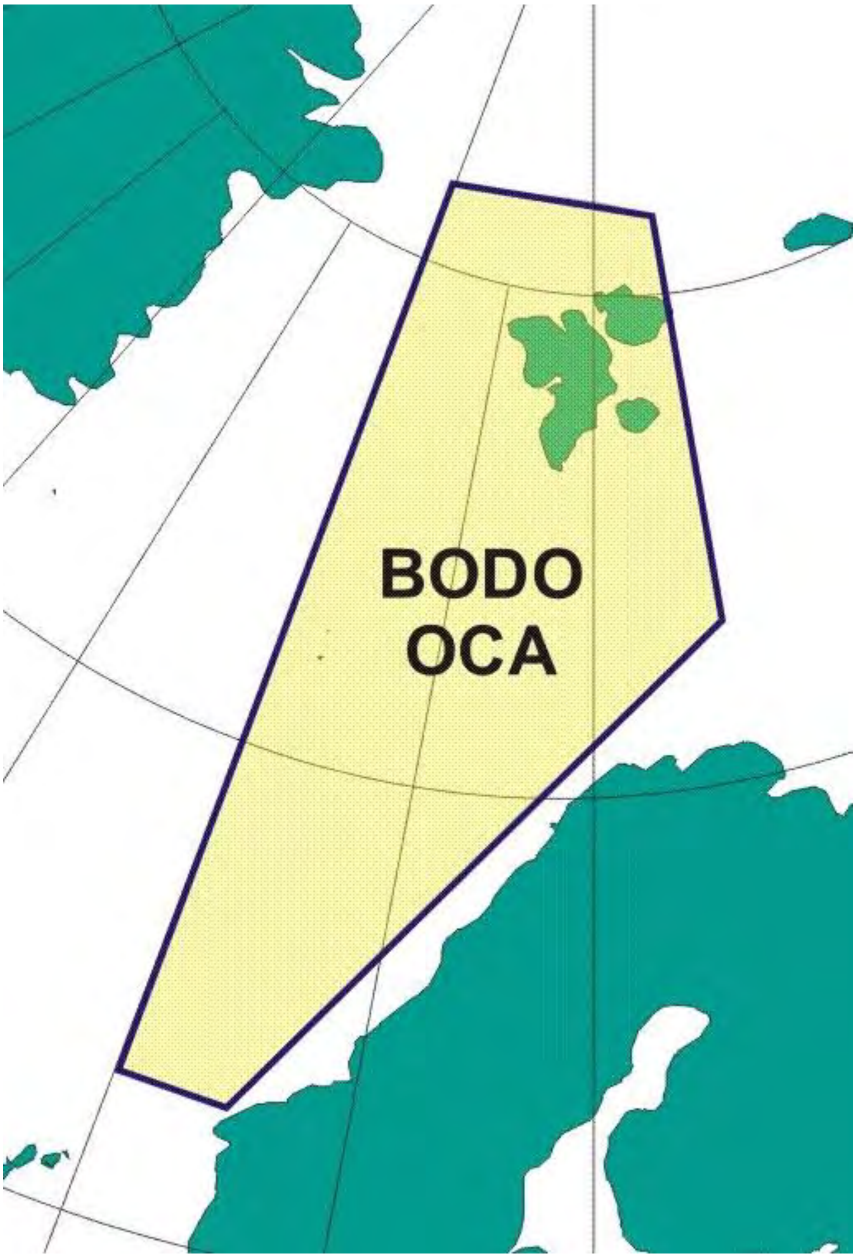
The VOLMET broadcast is an international broadcast providing Terminal Aerodrome Forecasts, and METARs, plus the New York and Caribbean Oceanic SIGMETs to pilots traversing the Atlantic Ocean and Caribbean Sea enroute to the United States. The VOLMET broadcast operates on the hour and thirty minutes past each hour, announcing the weather for 25 different airports, including 3 Caribbean Island air terminals. The program (as represented below) is divided into four 5-minute segments, each dealing with 6 terminals in a predetermined schedule, including any pertinent severe weather advisories. Immediately following the New York broadcast, a similar 10 minute presentation is made for airports in Canada by Gander Radio, located at Gander, Newfoundland.

The operating frequencies of the broadcast are 3485, 6604, 10051 and 13270 MHz. All transmitters are located at Barnegat, New Jersey.

Information related to a significant system failure or pertinent to a U. S. National emergency, MAY be available on VOLMET.

NAT VOLMET 3.485 6.604 10.051 13.270 MHz					
WSY 70 **NEW YORK**				VFG **GANDER**	
H + 00	**H + 05**	**H + 10**	**H + 15**	**H + 20**	**H + 25**
DETROIT CLEVELAND CINCINNATI Detroit Cleveland Cincinnati Indianapolis Pittsburgh	BANGOR WINDSOR LOCKS CHARLOTTE Bangor Windsor Locks Norfolk Charlotte	**NEW YORK** NEWARK BOSTON **New York** Newark Boston Baltimore Washington	BERMUDA MIAMI ATLANTA Bermuda Miami Nassau Orlando Atlanta	MONTREAL TORONTO OTTAWA **Gander** Montreal Toronto Ottawa Goose	WINNIPEG EDMONTON CALGARY CHURCHILL Kuujjuaq Winnipeg Churchill
H + 30	**H + 35**	**H + 40**	**H + 45**	**H + 50**	**H + 55**
CHICAGO MILWAUKEE MINNEAPOLIS Chicago Milwaukee Minneapolis Detroit Boston	INDIANAPOLIS ST LOUIS PITTSBURGH Indianapolis St Louis Pittsburgh Atlantic City	BALTIMORE PHILADELPHIA WASHINGTON Baltimore Philadelphia Washington **New York** Newark	NASSAU ORLANDO Bermuda Miami Nassau Orlando Atlanta Tampa West Palm Beach	**GANDER** ST JOHN'S HALIFAX **Gander** St John's Halifax Stephenville Montreal / Mirabel	GOOSE IQALUIT SØNDRE STRØM Goose Iqaluit Søndre Strøm Kuujjuaq

CHAPTER 6: DETAILED PROCEDURES – BODØ OACC



6.1 FIR FOR WHICH THE CONTINGENCY PLAN APPLIES

Bodø Oceanic FIR

6.2 FIRs WITH SUPPORTING PROCEDURES

Reykjavik FIR
Norway FIR, Stavanger AoR
Norway FIR, Oslo AoR
Sweden FIR, Stockholm AoR
Fin FIR, Rovaniemi AoR
Murmansk FIR

6.3 NOTIFICATION PROCEDURES

In a limited service situation notification of any service limitations and traffic management measures will be promulgated to operators and adjacent ANSPs by NOTAM normally not later than 12 hours prior to activation or as soon as practicable in case of an unexpected service interruption.

In a no service situation the OACC is likely to have been evacuated. As soon as possible after evacuation a contingency message will be sent by NOTAM and Iceland radio will advice aircraft within Reykjavik FIR/CTA. Adjacent centres will be advised by phone.

6.4 LIMITED SERVICE- PROCEDURES

The Regional Rules and Regulation for Bodø Oceanic Area Control Centre (OAC) address the issues of limited service provision in the Nat Region. In the event that Bodø OAC/ATCC must be evacuated, the specifics of section “6.5 NO SERVICE – PROCEDURES” will immediately be activated.

Once the Bodø Area Control Centre has been sterilized of oceanic traffic, the rebuilding of service provision will begin.

Until full service can be re-established Bodø OAC will delegate control of aircraft within Bodø Oceanic Control Area to Stavanger ATCC, Bodø ATCC Domestic sectors, Stockholm ACC and Reykjavik ACC.

Situations which could result in a Limited Service are:

Equipment Failure
- Transmitters (Loss of a number of Transmitters)
- Receivers (Loss of a number of Receivers)
- Aerials (Loss of a number of Aerials)

Propagation
- Radio Propagation resulting in partial fade-out can be affected by many factors including Solar Flares and Geomagnetic Storms

Staffing
- Reduced Staffing
- Illness
- Weather (Severe Weather i.e. Storm, Snow, Flooding)
- Industrial Relations issues

Security Threat

Depending on the level of the Security threat and if essential staff are allowed to remain on Station

6.4.1 Disruption of ground/air communication capability

A limited communication service will be maintained with the assistance of adjacent ACC's and Aeronautical Radio Stations. Appropriate frequencies will be advised by the assisting stations.

6.4.2 Disruption of ability to provide control services

Bodø OACC will determine, co-ordinate and promulgate any necessary restrictions to meet the service limitation.

Dispersal of Air Traffic

Aircraft already within the Bodø OCA, will be given priority for the limited services available. Aircraft intending to enter Bodø OCA will, if necessary, be restricted to meet the limited service capability. Random westbound routing may be restricted.

Communications

Communication services will be maintained to the possible extent using available equipment supplemented with the assistance of adjacent facilities. Aircraft unable to contact Bodø Radio on HF Frequency shall call one of the following stations:

Iceland Radio
Shannon Aeradio

Notification

Bodø OAC will notify all adjacent units and co-ordinate necessary traffic restrictions.

Responsibilities of adjacent OACs and ATCCs

The action required of adjacent ANSPs will vary dependant on the nature of the service limitation. Where such action is not contained within the inter-centre Letters of Agreement (LOAs) the requirement will be promulgated within the initial failure and restrictions message.

For Westbound traffic, Bodø OAC will issue clearances to 0^{o} Longitude only. Reykjavik OAC will assume responsibility west of 0^{o} Longitude. Eastbound traffic will be accepted as normal.

Separation Minima

Bodø OAC will be responsible for ensuring the coordination and implementation of any additional separation standard.

Same direction longitudinal separation may be increased if (e.g. add 5 minutes). Lateral separation will not be increased. Flight profile changes in the Bodø OCA may be limited.

Contingency Tracks

Bodø OAC shall publish contingency tracks within the Bodø OCA and ensure that the available limited Air Traffic Services are not overloaded.

Air Traffic Flow Management (ATFM) Requirements

Bodø OAC will, in conjunction with the NMOC , initiate ATFM measures as required.

6.5 NO SERVICE - PROCEDURES

Situations which could result in No Service being provided are:

Equipment Failure
- Transmitters (Loss of all Transmitters)
- Receivers (Loss of all Receivers)
- Aerials (Loss of all Aerials)

Propagation
- Radio Propagation resulting in total fade-out which can be caused by many factors including Solar Flares and Geomagnetic Storms

Staffing
- No Staff
- Illness (Seasonal Influenza)
- Weather
- Industrial Relations issues

Evacuation of Station
- Fire
- Bomb threat

6.5.1 Loss of ground/air communication capability

A limited communication service will be maintained with the assistance of adjacent ACC's and Aeronautical Radio Stations. Appropriate frequencies will be advised by the assisting stations.

6.5.2 Loss of ability to provide control services

Bodø ATCC includes Bodø Domestic Control, Bodø Oceanic Control and Bodø HF. Should Bodø ATCC be evacuated, the potential exist for a major disruption to Air Traffic Control service within Bodø AoR (Norway FIR from 62N to Russian Border boundary) and Bodø OFIR/OCA.

As soon as possible after evacuation Contingency Message will be forward to all concerned agencies.

Dispersal of Air Traffic

Where possible, aircraft already within the Bodø OCA will be notified that no services are available. Oceanic traffic intending to operate through Norwegian domestic airspace will require further clearance to do so.

Aircraft that elect to continue flight through Bodø OCA will operate on published tracks and at published flight levels. Aircraft that already are on random track will require specific co-ordination and approval from all concerned ATS units until the contingency tracks become active. The lowest flight level available for transiting flights will be FL280.

Traffic to and from Svalbard/ Longyear will use flight levels appropriate to direction of flight until exiting Bodø OCA. The highest available flight level will be FL270.

Communications

Bodø Radio and adjacent facilities will extend HF monitoring and assist with flight information services to aircraft within or about to enter Bodø OCA.

If unable to establish radio contact with adjacent facilities, flights may use SATCOM voice and satellite telephone to provide position reports.

Notification

Bodø OAC will attempt to notify adjacent units of the loss of service. If adjacent units are unable to establish contact with Bodø OAC, the phone numbers listed in the appendix can be used. Adjacent facilities are also listed.

Responsibilities of adjacent OACs and ATCCs

Adjacent OACs/ATCCs should implement ATFM measures as required. In addition, they may co-ordinate and publish routes to minimize the impact of the loss of service. Norwegian domestic ATCC will ensure that the necessary oceanic separation minima are established for traffic entering Bodø OCA from their area.

Reykjavik OAC will be required to:

Clear eastbound traffic in accordance with the contingency tracks and provide necessary separation; and

Organize a method of passing and receiving estimates with the Norwegian domestic ATCC.

Separation Minima

Longitudinal separation for all traffic entering Bodø OCA from Norwegian domestic airspace shall be increased by 10 minutes.

Contingency Tracks

The contingency tracks, FL280 or above, will be laterally separated and will use flight levels appropriate to direction of flight. Before leaving Bodø OCA, aircraft operating on contingency tracks shall request a clearance from the appropriate adjacent unit. Change of flight level will not be permitted while on the contingency tracks.

Air Traffic Flow Management

Bodø OAC will, in conjunction with theNMOC, initiate ATFM measures as required.

6.6 FLIGHT CREW AND OPERATOR PROCEDURES

6.6.1 For flights within the Bodø OCA when the contingency is activated

The procedures outlined below are to be used as guidance for pilots in the immediate aftermath of sudden withdrawal of the ATC service as described above.

On receipt of the contingency message pilots are requested to broadcast the information to other flights on VHF frequency 127,725 or 121,5.

Flights should establish communication with the next agency at the earliest opportunity stating current position, cleared Flight Level, next position and estimate and subsequent position. This also applies to flights using automatic position reports.

If unable to establish radio contact, flights may use SATCOM voice or satellite telephone to provide position reports.

Oceanic Centre	Telephone Number	SATCOM Inmarsat Short Code
Reykjavik	+354 568 4600	425105
Santa Maria	+351 296 820 438 +351 296 886 042 (satellite link)	426305
New York	+1 631 468 1413	436623
Ballygreen (Shanwick Aeradio)	+353 471 199	425002
Bodø	+47 755 42900	425702
Gander	+1 709 651 5207	431613

Flights may request their flight dispatch offices to forward position reports, if sending position reports to multiple ATS Units or if otherwise unable to forward position reports.

Flights operating with a received and acknowledged oceanic clearance will be expected to continue in accordance with the last clearance issued unless otherwise advised by ATC.

Flights involved in level change should complete the manoeuvre as soon as possible in accordance with the clearance.

Flights making automatic position reports are required to make voice position reports whilst within the Bodø OCA unless advised otherwise.

Communications with the next ATSU should be established at the earliest opportunity. Where no contact with the next agency can be established, Shanwick radio should be contacted on HF for advice.

6.6.2 For flights approaching the Bodø OCA when the contingency is activated

Not in Receipt of an Oceanic Clearance

In the event that Bodø OACC must be evacuated, only aircraft with received and acknowledged oceanic clearances shall be permitted to transit Bodø OCA.

If aircraft are unable to obtain or acknowledge an oceanic clearance, flights must plan to re-route around the Bodø OCA or to land at an appropriate aerodrome. Request the appropriate re-clearance on the current frequency.

In receipt of an acknowledged Oceanic Clearance

Aircraft operating with a received and acknowledged ocean clearance should proceed in accordance with the clearance. Flights should not request changes in altitude, speed or route except for reasons of flight safety or to comply with the oceanic clearance.

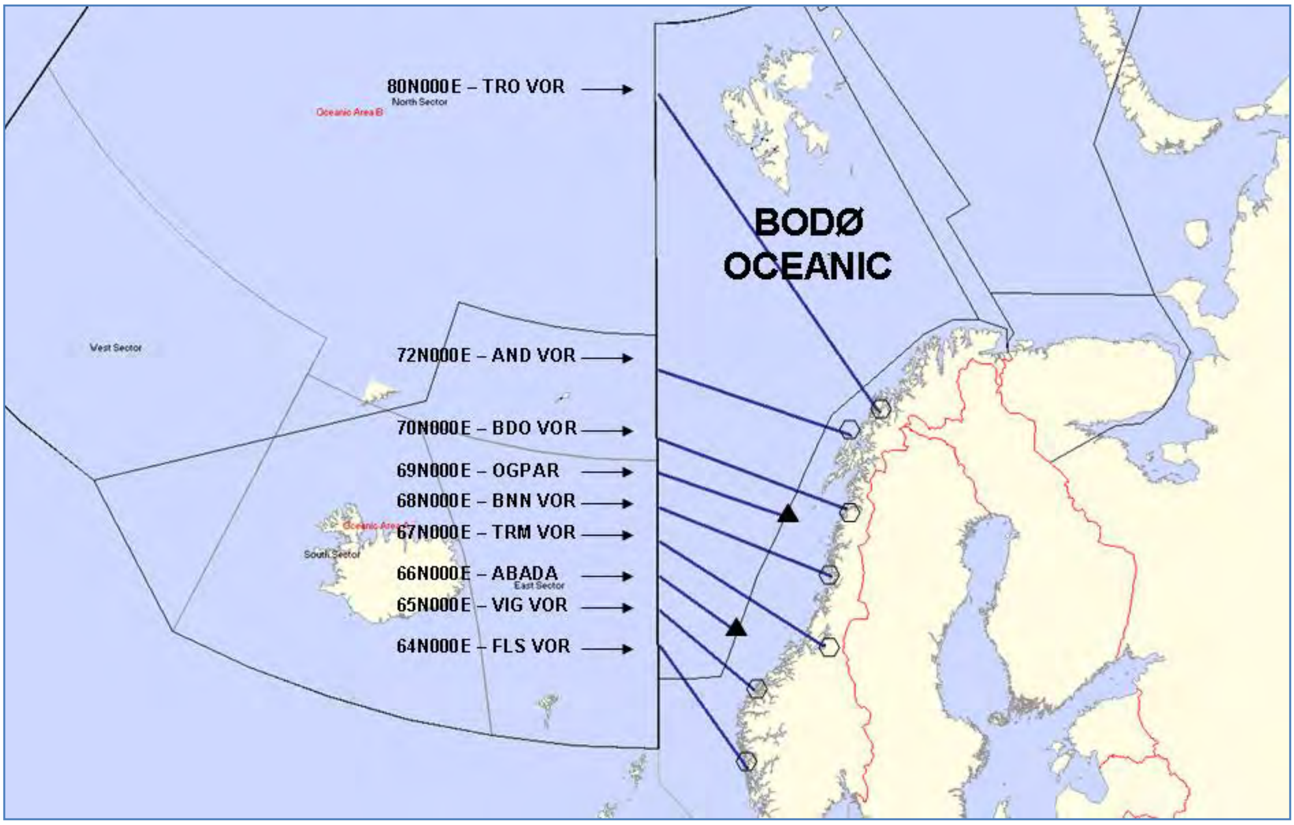
Entering from another OCA

Flights within Reykjavik Oceanic Airspace, can anticipate a large re-route to avoid the Bodø OCA.

Reykjavik will issue advice on procedures to be followed.

6.7 BODØ OACC – CONTINGENCY ROUTE STRUCTURE

6.7.1 For activation within Bodø FIR



Bodø OCA Contingency Tracks, FL280 or above

Latitude at 0°L	Domestic border/Landfall
80N	TRO
72N	AND
70N	BDO
69N	OGPAR
68N	BNN
67N	TRM
66N	ABADA
65N	VIG
64N	FLS

Westbound traffic shall use even levels, and eastbound traffic shall use odd levels.

6.8 LONG TERM CONTINGENCY ARRANGEMENTS

In development.

Appendix A –

Procedures by Adjacent Areas in Event of Bodø OAC/ACC Evacuation

NONE

Appendix B –

Contact Details – Bodø OACC

Bodø Supervisor (07:00-22:00)	+47 755 42900
Bodø Supervisor Mob.(07:00-22:00)	+47 478 06643
Bodø OACC/ACC Telefax	+47 755 20733
Oceanic Sector primary commercial	+47 755 42935
Domestic Sector primary commercial	+47 755 20391
All Sectors 2nd backup (mobile)	+47 478 06644
All Sectors 3rd backup (mobile)	+47 478 06647
System Operators and Flight Data Specialists	+47 755 42902
Systems Department	+47 670 33830
Manager Bodø OACC/ACC Mr. Raymond Ingebrigtsen	+47 670 33751 +47 992 32628 (mobile)
Operational Manager Bodø OACC/ACC Mr. Morten Tjønndal	+47 670 33753 +47 911 05587 (mobile)
Bodø Radio	+47 755 42940

Appendix C –

Evacuation Messages – Bodø OACC

AFTN

Bodø OACC/ACC has been evacuated, limited availability via telephone numbers: +47 478 06643(supervisor), +47 478 06644(oceanic sector).

Bodø OACC/Bodø Radio on voice

Emergency evacuation of Bodø OACC/ACC is in progress. No air traffic control service will be provided by Bodø. Use extreme caution and monitor frequency 127.725 MHz, emergency frequencies, air to air frequencies and NAT D family HF frequencies.

CHAPTER 7: DETAILED PROCEDURES – SHANNON ACC

7.1 FIR FOR WHICH THE CONTINGENCY PLAN APPLIES

Shannon FIR

7.2 FIRs WITH SUPPORTING PROCEDURES

Shanwick Oceanic FIR

7.3 LIMITED SERVICE

Dispersal of Traffic

Shannon shall determine, co-ordinate and promulgate any necessary restrictions to meet the service limitation. The NAT traffic eastbound already within the OCA will have priority of remaining services.

Westbound Flights

Traffic in possession of a valid oceanic clearance shall continue in accordance with its Oceanic Clearance, Shannon will endeavor in as far as possible that flights will enter Shanwick OCA at the time and flight level specified in the oceanic clearance.

Aircraft not in receipt of an Oceanic clearance will be kept clear of Shanwick OCA.

Eastbound Flights

Eastbound NAT traffic will receive priority of the remaining services and will normally be accepted without restriction.

Communications

Communication services will be maintained by using available equipment backed up by reserve Radio Equipment (RBS) and relays via Shanwick radio if required.

Notification

Shannon ACC will notify adjacent ATCC and NMOC of the situation.

Responsibilities of other adjacent centres.

Details are contained in the relevant annexes of the Letters of Agreement between Shannon and adjacent ACCs.

Separation Minima

After consideration of the situation affecting the provision of ATC services, Shannon ACC may decide to increase separation minima and will inform adjacent centres accordingly.

Air Traffic Flow Management

Shannon will co-ordinate any necessary traffic management measures with the NMOC.

7.4 NO SERVICE

Dispersal of traffic

Westbound Flights

Westbound flights not already in the Shannon FIR/UIR/SOTA or NOTA will be routed clear of the Shannon ACC by the ACC concerned.

Shannon shall advise westbound flights already within the Shannon FIR/UIR/SOTA or NOTA as follows…

- Aircraft at assigned OAC level to contact Shanwick on VHF or HF.
- Aircraft not at assigned OAC levels will be instructed to climb immediately to OAC levels and contact Shanwick. Where aircraft are restricted in climb due traffic, they will be cleared to the highest available track level and instructed to contact Shanwick.

Eastbound Flights

Shanwick will attempt to reroute eastbound flights clear of the Shannon FIR/UIR/SOTA or NOTA.

If Shanwick are unable to route aircraft clear of the Shannon FIR/UIR/SOTA/NOTA, they will advise the flights of the non availability of service in the Shannon area and adopt the Procedures detailed below:

- Eastbound NAT overflying traffic will continue to landfall and after that position, direct to a point on the Scottish, London or Brest FIR boundary associated with that landfall point (See chart below). Aircraft will maintain their assigned OAC level and Mach No. and contact the adjacent centre for further instruction as soon as possible. Shanwick will advise Scottish, London or Brest of the estimate for the FIR entry point based on the estimate/report for 20W/15W positions and no level changes shall be effected without co-ordination between Shanwick and the centre involved. See notes below.

Landfall points and associated FIR Boundary points

Landfall	Route	Boundary Point	Elapsed Time	Contact
AGORI		See Note 1		Scottish
KESIX	DCT	IBROD	17	Scottish
BEGID	DCT	MIMKU	17	Scottish
SOVED	DCT	MIMKU	17	Scottish
MOGLO	DCT	NIBOG	17	Scottish
NETKI	DCT	NIBOG	17	Scottish
KOKIB	DCT	LIFFY	40	LAC (Swanwick)
BEXET	DCT	LIFFY	38	LAC (Swanwick)
OLGON	DCT	LIPGO	40	LAC (Swanwick)
GISTI	DCT	SLANY	38	LAC (Swanwick)
RILED	DCT	SLANY	41	LAC (Swanwick)
~~DOLUL~~ XETBO	DCT	NORLA	33	LAC (Swanwick)
LEKVA	DCT	NORLA	33	LAC (Swanwick)

Landfall	Route	Boundary Point	Elapsed Time	Contact
ELSOX	DCT	LESLU	28	LAC (Swanwick)
EPUNA	DCT	LESLU	29	LAC (Swanwick)
ATSUR	DCT	GAPLI	29	LAC (Swanwick)
BIMGO	DCT	GAPLI	29	LAC (Swanwick)
~~NERTU~~ NASBA	DCT	RATKA	29	Brest
OMOKO	DCT	TAKAS See Note 2	20	Brest
TAMEL	DCT	See Note 3	12	Brest
LASNO	DCT	See Note 4		Brest

Note 1: Traffic planned to enter the Shannon AOR via AGORI will be re-routed by Shanwick to enter Scottish airspace north of the Shannon AOR.

Note 2: Traffic planned to enter the Shannon AOR via OMOKO will not continue to landfall but will be cleared direct from the common boundary to TAKAS to ensure track separation with the NASBA~~NERTU~~/RATKA track.

Note 3: Traffic planned to enter the Shannon AOR via TAMEL will not continue to landfall but will be cleared direct from the common boundary to TULTA. If there is conflicting traffic routeing OMOKO – TAKAS, an other form of separation will be applied.

Note 4: Traffic planned to enter the Shannon AOR via LASNO will be re-routed by Shanwick to enter Brest airspace south of the Shannon AOR.

Communications

Communication services may be possible by using Shanwick radio. Inter centre telephone communication will be established and may be supplemented with the assistance of adjacent centres. Shannon will notify Shanwick of the relevant frequencies in use in Scottish, London and Brest.

Search and Rescue

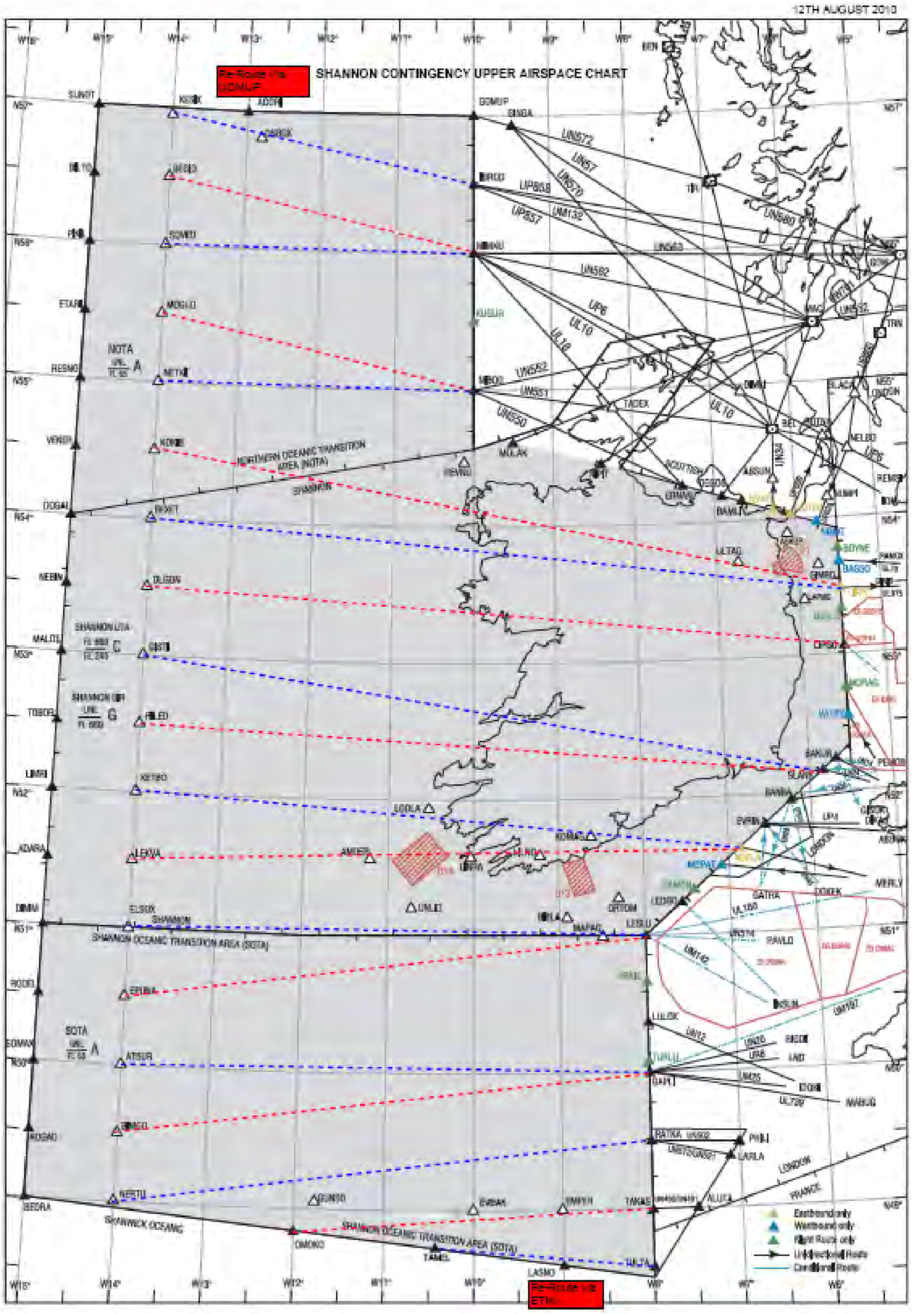
Should Shanwick become aware of an aircraft in need of Search & Rescue in Shannon’s area of responsibility, they shall forward this information immediately to the Station Manager, Air Traffic Control, Dublin.

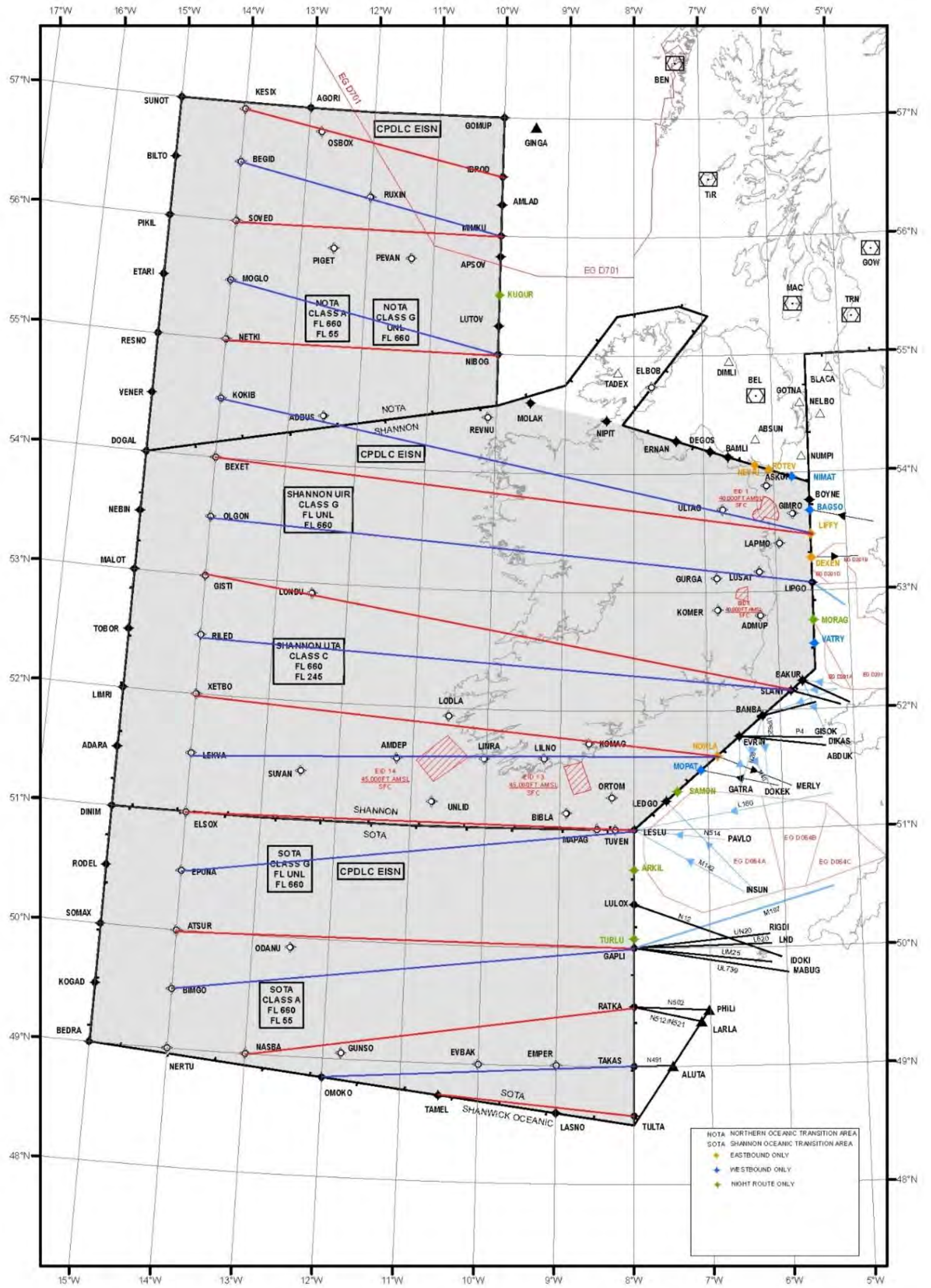
Responsibility of the other adjacent centres

Details are contained in the relevant annexes of the Letters of Agreement between Shannon and adjacent ACCs.

7.5 SHANNON ACC – CONTINGENCY ROUTE STRUCTURE

7.5.1 For activation within Shannon FIR - NAT Eastbound Contingency Routes





CHAPTER 8: DETAILED PROCEDURES – BREST ACC

8.1 FIR FOR WHICH THE CONTINGENCY PLAN APPLIES

Brest FIR

8.2 FIRs WITH SUPPORTING PROCEDURES

Shanwick Oceanic FIR

8.3 LIMITED SERVICE

Dispersal of Traffic

The NAT traffic eastbound already within the OCA will have priority of the remaining services. The Brest supervisor will determine with the Brest FMP the need of traffic management measures and will inform the NMOC.

Westbound Flights

with Shanwick Brest ACC will respect as far as possible the oceanic clearances so as to present the flights at time and level co-ordinated.

with Shannon, if the ACT message is working normally there will be no difference with the present procedures. In case of radar troubles the reduced separation procedures and radar handover procedures shall be cancelled.

Eastbound Flights

from Shanwick and Shannon the flights will be accepted without any restriction. In case of a failure of the ACT message a telephone call will be necessary for each flight. In case of radar troubles the reduced separation procedures and radar handover procedures shall be cancelled with Shannon.

Communications

Communication services will be maintained either by using back up radio equipment or available equipment supplemented with the assistance of adjacent facilities.

Notification

Brest ACC will notify the situation to the NMOC and to all adjacent units.

Responsibilities of other adjacent centres

All details are in the Letters of agreement established between the different adjacent centres.

Separation minima

Considering the importance of the troubles affecting the ATC services, Brest ACC can decide of an increase of the separation minima.

Air Traffic Flow Management

Brest ACC will co-ordinate any necessary traffic management measure with the NMOC.

8.4 NO SERVICE

8.4.1 Dispersal of traffic

The Brest supervisor will inform the NMOC (Network Manager Operational Centre) and the adjacent centres. The NMOC will issue a message instituting an alternative route traffic scheme.

WESTBOUND FLIGHTS

If the flights are not in Brest airspace they will be re-routed by the concerned ACC clear of the Brest ACC area.

Already in Brest area, proceeding to Shannon:

Westbound traffic continue the flight in accordance with the current flight plan and maintain the last acknowledged cruising level until the exit point. It is strongly recommended to the pilot to try to contact Shannon as soon as possible so as to continue the flight in normal condition.

Already in Brest area, proceeding to Shanwick:

If the aircraft has received an oceanic clearance from Shanwick, he is allowed to continue to the exit point (SIVIR, UMLER, SEPAL, BUNAV, or ETIKI) in accordance with the current flight plan and at the last acknowledged cruising level received from Brest ACC. Any level or speed changes required to comply with the oceanic clearance shall be completed after the specific points at 008°00W (RIVAK, TIVLU, LAPEX, UMOXA, or REGHI).

The aircraft will continue the flight after 008°45W on Shanwick frequency.

If the aircraft has not received an oceanic clearance he is allowed to continue to the specific point at 008°00W (RIVAK, TIVLU, LAPEX, UMOXA, or REGHI) in accordance with the current flight plan and at the last acknowledged cruising level received from Brest ACC. It is strongly recommended to the pilot to try to contact Shanwick as soon as possible so as to get an oceanic clearance*.

Today, in normal conditions, aircraft have good radio communications with Shanwick thirty minutes before the exit points.

When the contact with Shanwick has been established and the oceanic clearance obtained, any level or speed changes required to comply with this oceanic clearance shall be completed after the specific points at 08.000W (RIVAK, TIVLU, LAPEX, UMOXA. or REGHI).

The aircraft will continue the flight after 08.000W on Shanwick frequency.

Flights proceeding to Brest area:

In accordance with the NMOC all these flights will be instructed to avoid Brest area.

EASTBOUND FLIGHTS

Already in Brest area:

The Eastbound traffic will continue in accordance with the current flight plan and maintain the last acknowledged cruising level. Each concerned aircraft will try to contact the next ACC, in accordance with the current flight plan as soon as possible so as to give a position report and flight details to that ACC.

Flights proceeding to Brest area:

Eastbound traffic will be rerouted by Shannon ACC clear of Brest area.

Eastbound traffic will whenever possible be rerouted by Shanwick OACC clear of Brest area.

These traffic that cannot be rerouted by Shanwick will follow the procedure hereafter :

Maintain their last oceanic flight level.

Squawk 2000.

-Navigate as detailed below :

Traffic leaving Shanwick OACC airspace via :

ETIKI:

Traffic with destination LFPG/LFPO/LFPB shall route direct from REGHI to DVL (Deauville VOR) and be instructed to contact Paris ACC.

Other traffic shall route direct from REGHI to TSU (Toussus VOR) and be instructed to contact Reims ACC as soon as possible.

UMLER:

Traffic shall route direct from UMOXA to TSU (Toussus VOR) and be instructed to contact Reims ACC as soon as possible

SEPAL:

Traffic with destination LFPG/LFPO/LFPB shall route direct from LAPEX to ANG (Angers VOR) and be instructed to contact Paris ACC as soon as possible.

Other traffic shall route direct from LAPEX to CNA (Cognac VOR) and be instructed to contact Bordeaux ACC as soon as possible.

SIVIR:

Traffic shall route direct from RIVAK to SAU (Sauveterre VOR) and be instructed to contact Bordeaux ACC as soon as possible.

BUNAV:

Traffic shall route direct from TIVLU to CNA (Cognac VOR) and be instructed to contact Bordeaux ACC as soon as possible

Communications

In case of a total radio failure, at present time there is no plan to guarantee the possibility for any adjacent centre to cover a part of Brest airspace.

Notification

In the event of a total loss of service Brest will inform the NMOC and all the adjacent centres.

Responsibilities of the other adjacent centres

All the details are in the Letters Of Agreement between the different adjacent centres.

Separation minima

Traffic that cannot be re-routed by Shanwick to avoid Brest airspace will have to navigate as described in paragraph 1.7.2. This will ensure lateral separation until the above mentioned fixes. Whenever possible, Shanwick will try to establish increased separation at the Oceanic Exit Point.

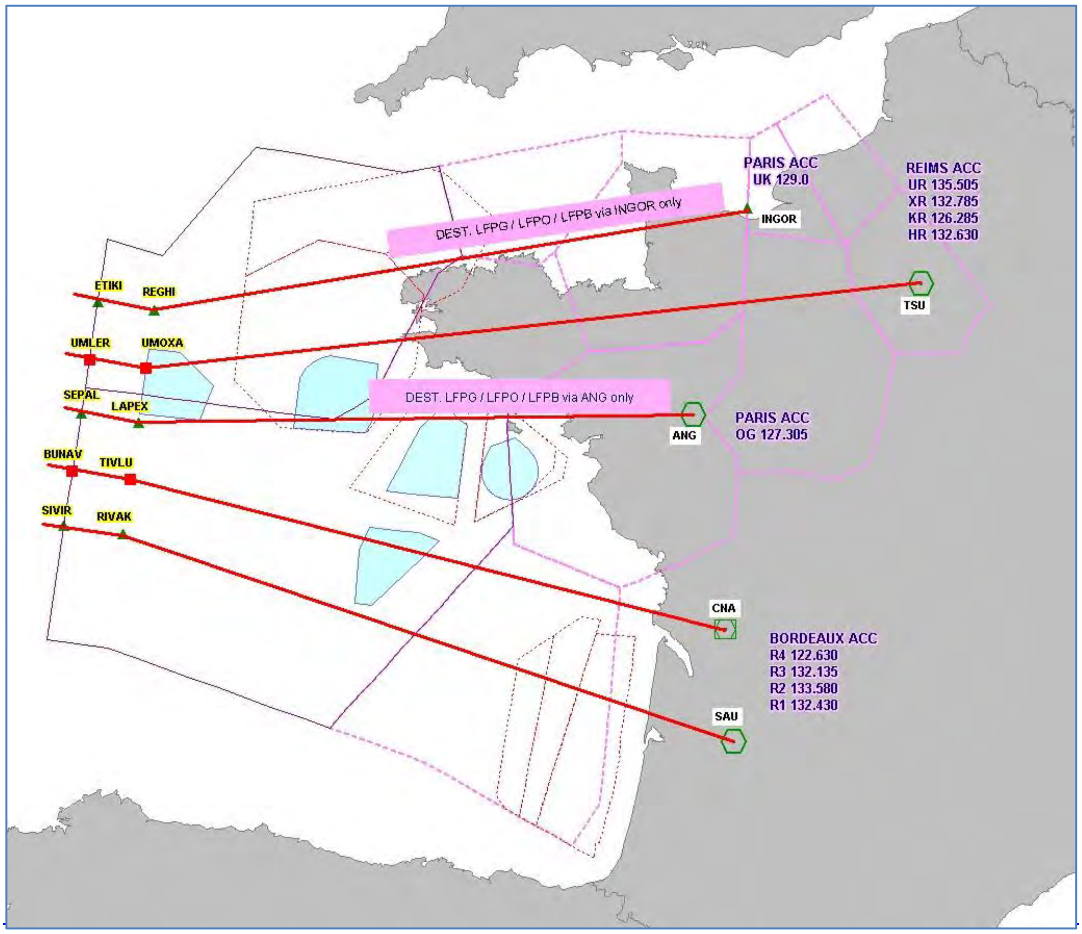
Air Traffic Flow management

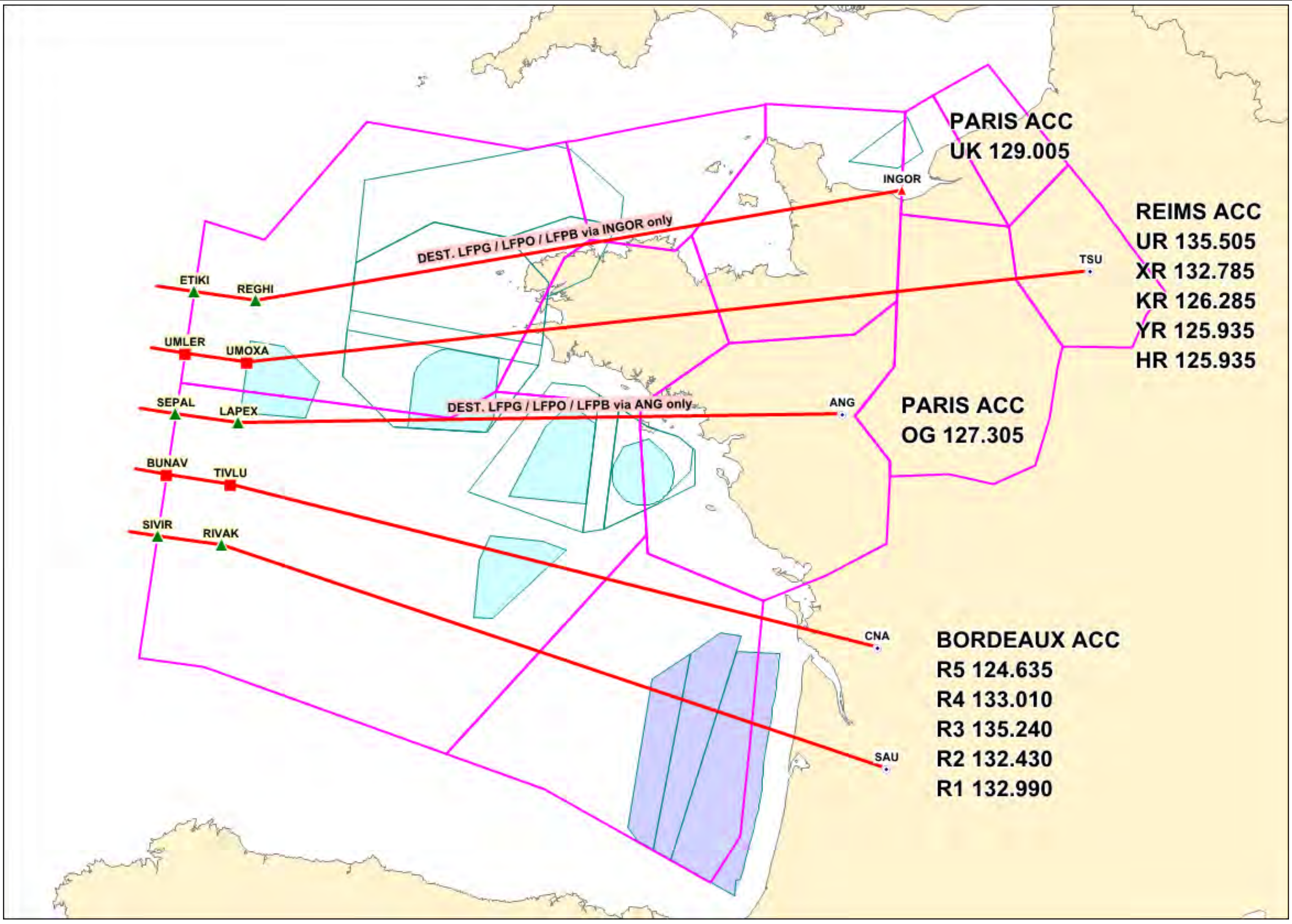
The NMOC should be in charge of all necessary flow management procedures in case of re-routeing or transfer of the Brest area to another ATCC.

8.5 BREST ACC – CONTINGENCY ROUTE STRUCTURE

8.5.1 For activation within Brest FIR

Unless instructed otherwise, flights entering the Brest FIR should use the following contingency route:




PARIS ACC
UK 129.005
INGOR
REIMS ACC
UR 135.505
XR 132.785
KR 126.285
YR 125.935
HR 125.935
TSU
DEST. LFPG / LFPO / LFPB via INGOR only
ETIKI
REGHI
UMLER
UMOXA
SEPAL
LAPEX
DEST. LFPG / LFPO / LFPB via ANG only
ANG
PARIS ACC
OG 127.305
BUNAV
TIVLU
SIVIR
RIVAK
CNA
BORDEAUX ACC
R5 124.635
R4 133.010
R3 135.240
R2 132.430
R1 132.990
SAU

— **END** —

APPENDIX R — AMENDMENTS TO THE NORTH ATLANTIC OPERATIONS AND AIRSPACE MANUAL (NAT DOC 007) RELATED TO PBCS OPERATIONS, SLOP AND DELETION OF "ABERDEEN ATSU"

(*paragraph 5.5.2 refers*)

Amendments related to PBCS Operations
Insert the following proposed text in NAT Doc 007, section 1.10 "PBCS OPERATIONS", as new paragraphs 1.10.3 and 1.10.4:

1.10.3 Application of the reduced lateral and longitudinal separation minima in the NAT Region is dependent on a smooth functioning FANS 1/A data link system. Various known data link related deficiencies in aircraft systems and poor data link performance have a detrimental effect on the air traffic control system and impede aircraft operator's efforts to obtain performance-based communication and surveillance (PBCS) authorizations. Many of these known deficiencies have already been fixed by aircraft manufacturers and software upgrades are available. To ensure the best possible functioning of the NAT air traffic control system, it is of utmost importance that aircraft operators always operate the latest available FANS 1/A related software version in aircraft that fly in the NAT high level airspace (HLA) and that the aircraft systems are configured in an optimal manner. Meanwhile, implementation of improvements and corrections is also a priority undertaking for the ground and network segments of the overall FANS 1/A system

1.10.4 NAT OPS Bulletin 2019_003 provides a list of recommended data link performance improvement options and recommended software versions for NAT data link operations. Aircraft operators are advised to review this OPS Bulletin to identify if some of the issues identified in the Bulletin apply to their operations. The bulletin will be updated on regular basis.

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Amendments related to Strategic Lateral Offset Procedures (SLOP)
Amend the text in NAT Doc 007, section 8.5 "Strategic Lateral Offset Procedures (SLOP)" as follows:

Strategic Lateral Offset Procedures (SLOP)

8.5.8 While ATC clearances are designed to ensure that separation standards are continually maintained for all traffic errors do occur. ~~However, the chain of clearance definition, delivery and execution involves a series of technical system processes and human actions. Errors are very rare but they do occur.~~ Neither flight crews nor controllers are infallible. Gross Navigation Errors (usually involving whole or half latitude degree mistakes in route waypoints) are made, and aircraft are sometimes flown at flight levels other than those expected by the controller. Ironically, when ~~When~~ such errors are made, ~~ironically,~~ the extreme accuracies of modern navigation and height keeping systems themselves increase the risk of a ~~an actual~~ collision. Within an ATS Surveillance environment where VHF communications are available, controllers ~~is~~ alerted to such errors will ~~and can, using VHF voice communications,~~ intervene using VHF voice communications. ~~in a timely fashion.~~ In areas, (surveillance or otherwise) where VHF voice communication is not available, controllers rely on voice and data link position reports augmented by ADS-C and ADS-B transmissions to monitor conformance. Controllers, when alerted to errors, will intervene using HF, CPDLC, SATVOICE or any other means available. ~~This is not the case in oceanic airspace, such as the North Atlantic, where the controller's awareness of the disposition of a significant proportion of the traffic is reliant largely upon flight crew position reports through communication links utilising HF or SATVOICE via third party radio operators. And furthermore, even among that proportion of traffic utilising data link for automated position reporting, and perhaps ATS communications, navigation errors continue to occur. Consequently, it~~ Given the potential delay in intervention, it has been determined that ~~allowing aircraft conducting~~ encouraging aircraft operating in ~~oceanic~~ the NAT ~~flight~~ to fly self-selected lateral offsets ~~will~~ provides an additional safety margin and mitigates the risk of traffic conflict when non-normal events (such as aircraft navigation errors, height deviation errors and turbulence induced altitude-keeping errors) do occur. Collision risk is
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significantly reduced by application of these offsets. These procedures are known as “Strategic Lateral Offset Procedures (SLOP)”.

8.5.9 This procedure provides for offsets within the following guidelines:

a) ~~along a route or track there will be three positions that~~ an aircraft may fly offsets right of centreline up to a maximum of 2 NM~~: centreline or one or two miles right~~ ~~*(Note: SLOP provisions as specified in ICAO PANS-ATM Doc.4444 were amended 13 November 2014 to include the use of “micro-offsets of 0.1 NMs for those aircraft with this FMS capabilty. Appropriate guidance for the use of this amended procedure in the North Atlantic is under study and hence pending);*~~ *and*

~~b) offsets will not exceed 2 NM right of centreline; and~~

~~c~~b) offsets **left** of centreline are **not permitted** ~~**must not be made**~~.

8.5.10 Distributing aircraft laterally and equally across ~~the three~~ all available positions adds an additional safety margin and reduces collision risk. SLOP is now **a standard operating procedure** for the entire NAT region and flight crews **are required** to adopt this procedure as is appropriate. In this connection, it should be noted that:

a) Aircraft without automatic offset programming capability must fly the centreline.

b) Aircraft able to perform offsets in tenths of nautical mile should do so as it contributes to risk reduction.

~~b) To achieve an equal distribution of flying the centreline or 1 NM (one nautical mile) right or 2 NM (two nautical miles) right of centerline,~~

c) I~~i~~t is recommended that flight crews of aircraft capable of programming automatic offsets should randomly select flying centreline or an offset. In order to obtain lateral spacing from nearby aircraft (i.e. those immediately above and/or below), flight crews should use whatever means are available (e.g. ACAS/TCAS, communications, visual acquisition, GPWS) to determine the best flight path to fly.

~~c~~d) An aircraft overtaking another aircraft should offset within the confines of this procedure, if capable, so as to ~~create the least~~ minimize the amount of wake turbulence for the aircraft being overtaken.

~~d~~e) For wake turbulence purposes, flight crews should fly one of the ~~three~~ offset positions ~~shown above~~. ~~Flight crews should not offset to the left of centreline nor offset more than 2 NM right of centreline.~~ Flight crews may contact other aircraft on the air-to-air channel, 123.450 MHz, as necessary; to co- ordinate the best wake turbulence mutual offset option. *(Note. It is recognized that the flight crew will use their judgement to determine the action most appropriate to any given situation and that the pilot-in-command has the final authority and responsibility for the safe operations of the aircraft. See also Chapter 13)* ~~As indicated below, contact with ATC is not required.~~

~~e~~f) Flight crews may apply an offset outbound at the oceanic entry point and must return to centreline prior to the oceanic exit point unless otherwise authorized by the appropriate ATS authority or directed by the appropriate ATC unit.

~~f) Aircraft transiting ATS Surveillance-controlled airspace mid-ocean should remain on their already established offset positions.~~

g) There is no ATC clearance required for this procedure and it is not necessary that ATC be advised.

h) Voice Position reports should be based on the waypoints of the current ATC clearance and not the offset positions.

i) Aircraft shall not apply SLOP below F285 in the Reykjavik CTA and Bodo OCA.

~~8.5.11 Flight crews should attempt to determine the offsets (if any) being flown by aircraft immediately ahead on the same track one flight level above and one flight level below. And then select an offset which differs from those. If this is not possible or practical, then flight crews should randomly choose one of the three flight path options.~~

~~8.5.12 On bi-directional routes a LEFT offset will INCREASE collision risk rather than decrease it. There are areas in the NAT region where bi-directional traffic flows are routinely used. And there are times when opposite direction traffic may be encountered in any part of the region. Flight crews must therefore recognise that **LEFT offsets from the cleared track centre-line must not be adopted**. The avoidance of wake turbulence (even in the OTS) can be accomplished effectively within the confines of the SLOP procedures, as specified in paragraph 8.5.10. Flight crews should communicate with the other aircraft involved to coordinate a pair of mutual offsets from within the allowed three options, in order to mitigate any wake-turbulence issue.~~

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Amendment related to deletion of "Aberdeen ATSU" from paragraph 17.3.2.
Amend the text in NAT Doc 007, section 17.3 "North Atlantic Flight Operations" as follows:
. . .

17.3 North Atlantic Flight Operations

17.3.1 Most of the airspace in oceanic FIRs/CTAs is high seas airspace within which the Rules of the Air (ICAO Annex 2) apply without exception. The majority of the airspace is also controlled airspace, and instrument flight rules (IFR) apply when above FL 055.

17.3.2 This controlled airspace includes:

1. New York Oceanic East, Gander Oceanic, Shanwick Oceanic, Santa Maria Oceanic, Reykjavik Oceanic, GOTA and NOTA, and Bodø;

2. Bodø Oceanic above FL 195 and when operating more than 100 NM seaward from the shoreline;

3. Nuuk FIR when operating above FL 195:

4. Faroes Islands above 7500 ft;

~~**5.** Aberdeen ATSU above FL085 during operational hours (see AIP);~~

~~6~~5. Jan Mayen 2000 ft above ground level.

17.3.3 Canada, Denmark and Iceland require that the flight crew and aircraft be IFR rated for trans-oceanic flight, regardless of the altitude to be flown. It is highly unlikely that the flight will remain VMC when transiting the Atlantic.
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APPENDIX S — NAT OPS BULLETIN ON DATA LINK PERFORMANCE IMPROVEMENT OPTIONS (SERIAL NO: 2019_003)

(*paragraph 5.5.3 refers*)

NAT OPS BULLETIN

Serial Number: **2019_003**
Subject: **Data Link Performance Improvement Options**
Originator: **NAT SPG**

Issued: TBD 2019
Effective: X May 2019

The purpose of this North Atlantic Operations Bulletin (NAT OPS) is to provide guidance to North Atlantic (NAT) operators regarding options that are available to improve data link performance.

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

ICAO EUR/NAT Office: ***icaoeurnat@paris.icao.int***

The NAT OPS Bulletin Checklist is available at ***www.icao.int/EURNAT/EUR & NAT Documents****,* ***NAT Documents****, then* ***NAT Ops Bulletins*****.**

NAT OPERATIONS BULLETIN – DATA LINK PERFORMANCE IMPROVEMENT OPTIONS

1. Purpose of Bulletin. The purpose of this bulletin is to provide guidance to North Atlantic (NAT) operators regarding options that are available to improve data link performance.

2. Background. Application of the reduced lateral and longitudinal separation minima in the NAT Region is dependent on a smooth functioning FANS 1/A data link system. Various known data link related deficiencies in aircraft systems and poor data link performance have a detrimental effect on the air traffic control system and impede aircraft operator's efforts to obtain performance-based communication and surveillance (PBCS) authorizations. Many of these known deficiencies have already been fixed by aircraft manufacturers and software upgrades are available. To ensure the best possible functioning of the NAT air traffic control system, it is of utmost importance that aircraft operators always operate the latest available FANS 1/A related software version in aircraft that fly in the NAT high level airspace (HLA) and that the aircraft systems are configured in an optimal manner. Meanwhile, implementation of improvements and corrections is also a priority undertaking for the ground and network segments of the overall FANS 1/A system.

3. The list of recommended data link performance improvement options provided in the **Attachment** to this OPS Bulletin describes the problems and solutions identified to improve data link performance. However, it should be noted that not all aircraft operators experience all these problems and therefore not all solutions apply to all aircraft operators. Additionally, while acknowledging there is confidence that the recommended improvement options would improve the data link performance, it should be noted that these updates might not be necessarily seen as sufficient to ensure a PBCS authorization. Aircraft operators are advised to consult with aircraft manufacturers for guidance regarding implementation of the improvement options.

4. The certification status versus EUROCAE ED-122 / RTCA DO-306 standards and PBCS authorization requirements should be clarified by aircraft operators in coordination with the manufacturers concerned, recognizing the aircraft operators need to consider the economic and operational aspects and priorities.

5. Websites

5.1 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. Contacts

6.1 Any queries about the content of this bulletin should be addressed to ICAO EUR/NAT Office:

icaoeurnat@paris.icao.int.

ATTACHMENT - LIST OF DATA LINK PERFORMANCE IMPROVEMENT OPTIONS

PROBLEM / ISSUE	SOLUTIONS / ACTIONS
1. HF datalink – next-on-busy 1.1 Airbus ATSU and Rockwell Collins CMU-900 avionics may contain a feature called “next-on-busy” by which those avionics send a new downlink message via HF datalink when outside of VHF coverage and SATCOM is busy sending a previous downlink, instead of waiting for SATCOM to finish sending the previous downlink and then sending the new downlink via SATCOM. This feature reduces datalink performance because the avionics can actually deliver the new downlink more quickly if they wait for SATCOM to finish sending the previous downlink and then send the new downlink via SATCOM. On airframes equipped with Rockwell Collins CMU-900, this problem is compounded by subsequent downlink messages being queued while the avionics wait for acknowledgement of the HF datalink downlink message.	*Solution a): For CMU-900 installations with Iridium SATCOM where PBCS is showing poor performance, place the HF in “voice-only”. This option removes HFDL as an available media so the “next-on-busy” function will not occur.* At the recent FAA PARC CWG40, an Iridium SATCOM equipped operator demonstrated the PBCS performance impact of HFDL “next-on-busy”. Some other operators have also taken this action to place HF into “voice-only” mode. Iridium SATCOM operators, equipped with CMU-900, could take this action on interim basis prior to an available CMU software. See item 4 below on HFDL for similar recommendation.
	Solution b): Work with Airbus and Rockwell Collins to install software versions that disable the next-on-busy feature. (For the Rockwell Collins CMU-900 with recent software, this can be done with a database update).
2. VHF to SATCOM Transitions 2.1 Transitions from using VHF to using SATCOM, especially when they occur repeatedly in a short period of time, reduce datalink performance because the ACARS protocols are generally not designed to maximize performance but rather to minimize cost by persistently attempting to use less costly VHF.	*Solution a): Disable VHF datalink just prior to entering oceanic airspace* Implement flight crew procedures to disable VHF datalink (usually by placing the VHF radio used for VHF datalink into voice mode) just prior to entering oceanic airspace or prior to leaving contiguous VHF coverage in order to proactively force SATCOM use. Conversely, enable VHF datalink when exiting oceanic airspace or entering contiguous VHF coverage.
	Solution b): Implement more precise VHF region definitions In avionics that offer the capability to prefer specified subnetworks in defined geographic regions (including 777 DCMF and 787 CMF), implement more precise VHF region definitions that exclude areas of the world with only intermittent VHF subnetwork coverage in order to force SATCOM use in those areas. Such areas, in which the DLMA has observed consistent performance problems, include the North Pacific near the Aleutian Islands and the Kamchatka Peninsula, the South Pacific near New Caledonia and Vanuatu, and the North Atlantic near Bermuda and the Azores.

PROBLEM / ISSUE	SOLUTIONS / ACTIONS
	Solution c): Implement the ARINC 618 RAT1 timer Upgrade ACARS router avionics (CMU or equivalent) software to include the new ARINC 618 RAT1 timer when it becomes available. This timer is intended to improve performance for FANS downlink messages during VHF-to-SATCOM transitions by additionally attempting to send a message via SATCOM when attempts to send it via VHF have not been successful for 60 seconds (such as when exiting land-based VHF coverage). This feature is available on some new aircraft types and will gradually become available for retrofit via software updates on existing aircraft.
3. "Ack-and-toss" 3.1 ACARS router (CMU or equivalent) avionics may for various reasons acknowledge receipt of a FANS uplink message but then fail to deliver the message to the avionics that host the FANS applications. This is commonly known as "ack-and toss" behaviour.	*Solution a) Rockwell Collins CMU-900 software problem* For the 747-8, Boeing has certified core software -202 that fixes this problem. For the 737, 747-400, 757, 767 and MD11, Rockwell Collins is certifying core software -014 that fixes this problem. For the 747-400, 757, and MD-11, Boeing and Rockwell Collins are investigating certification opportunities.
	Solution b) Boeing 777 AIMS-2 software problem Boeing developed AIMS-2 BPV17.1 software that fixed this problem.
	Solution c) Airbus A320/A330/A340 software problem This problem occurs only in the ATSU CSB/CLR7.1 to 7.4 software versions. Airbus is developing the CSB/CLR7.5 software that fixes this problem. The issue is also fixed in the CSB/CLR9 software under development.
	Solution d) ARINC 618 false-positive duplicate uplink block identifier (UBI) determination ARINC 618-8, which was published in August 2016, contains a recommended avionics enhancement that reduces the likelihood of this problem occurring. For the 777, Boeing is developing AIMS-2 BPV17B software that implements the avionics enhancement. For the 787, Boeing developed CMF BPV4 software that implements the avionics enhancement. For the Honeywell CMU Mark II, Honeywell developed -522 software that implements the avionics enhancement. Similar software upgrades are or will be available for other affected ACARS router (CMU or equivalent) avionics, although it should be noted that the Rockwell Collins CMU-900 was never subject to this problem; the way it detects duplicate uplink blocks was standardized in ARINC 618-8 as the

PROBLEM / ISSUE	SOLUTIONS / ACTIONS
	recommended avionics enhancement. A complete solution, however, requires the Communication Service Providers (CSPs) to ensure that two sequential non-general response uplinks do not contain the same UBI value.
4. HF data link - general 4.1 HF datalink performance has not been demonstrated to meet the RCP240 and RSP180 specifications, although for various reasons the avionics may send FANS downlink messages via HF datalink. This behaviour has a detrimental effect on data link performance.	*Solution Manually prevent HF datalink use* Prevent HF datalink use manually by implementing flight crew procedures to disable HF datalink (usually by placing the HF radio used for HF datalink into voice mode).
5. Internetworking 5.1 The DLMA has observed that some performance problems are caused by the challenges of effective CSP internetworking when an aircraft operator chooses to use one of the two global CSPs (ARINC or SITA) for VHF and the other global CSP for SATCOM. (The DLMA also realizes that some aircraft operators configure their avionics to first prefer regional DSPs, such as Avicom in Japan, which has not been shown to affect performance).	*Solution: For aircraft operators that do not configure their avionics to first prefer a regional CSP, use the same global CSP for both VHF and SATCOM* It is likely that the data link performance will be improved if the same global CSP is used for both VHF and SATCOM.
6. Large Pilot Operational Response Time (PORT) values 6.1 PORT is one component of the Actual Communications Performance (ACP), the other being the Actual Communications Technical Performance (ACTP). For an uplink-downlink CPDLC transaction, PORT captures the human portion of the transaction time and ACTP captures the technical (mainly network) portion of the transaction time. Accordingly, large PORT values reduce performance.	*Solution: Implement flight crew procedures to respond to CPDLC messages with STANDBY when appropriate.* In accordance with ICAO Doc 9869, Performance-Based Communication and Surveillance (PBCS) Manual, ATS providers should exclude CPDLC transactions with STANDBY responses from performance monitoring. ICAO Doc 10037, Global Operational Data Link (GOLD) Manual explains in paragraph 4.3.2.4 when STANDBY responses are appropriate under certain circumstances: *4.3.2.4 The flight crew should respond to CPDLC messages as soon as practical after they are received. For most messages, the flight crew will have adequate time to read and respond within one minute. However, the flight crew should not be pressured to respond without taking adequate time to fully understand the CPDLC message and to satisfy other higher priority operational demands. If additional time is needed, the flight crew should send a RSPD-3 STANDBY response.*

PROBLEM / ISSUE	SOLUTIONS / ACTIONS
7. 747-8 and 787 SATCOM problems 7.1 The 747-8 and 787 aircraft occasionally experience undiagnosed SATCOM problems that have been shown to reduce performance. Aircraft operators are urged to assist Boeing and Rockwell Collins with investigating these problems by promptly submitting service requests to Boeing for SATCOM problems and by providing any requested information (such as SDU logs). The same recommendation to operators applies whenever SATCOM issues are reported/suspected on any other individual airframes.	*Promptly submit service requests to Boeing for SATCOM problems and provide any requested information (such as SDU logs).*
8. Unknown causes 8.1 If a data link performance problem has an unknown cause, then the DLMA recommends submitting a problem report at http://www.fans-cra.com/ so that the DLMA and other involved stakeholders can attempt to determine the cause.	*Submit problem reports at http://www.fans-cra.com/*
9. Software updates 9.1 Aircraft and avionics manufacturers work persistently on fixing problems that have been identified in data link operations. Periodically new software releases are issued that solve some of the problems that have been identified. Some of those fixes may improve data link performance and most of them fix issues that cause problems for pilots and air traffic controllers in the use of data link. 9.2 To ensure the best possible functioning of the NAT air traffic control system it is of utmost importance that aircraft operators take care to always operate the latest available FANS 1/A related software version in aircraft that fly in the NAT high level airspace and to ensure that the aircraft systems are configured in an optimal manner. A list of recommended aircraft avionics software versions is provided in the table below. 9.3 It should be noted that new software versions that fix several known data link problems will become available for many aircraft types within the next year. Operators are advised to seek information from aircraft manufacturers about the status of those new software releases.	*Update FANS 1/A related software using the list of recommended aircraft avionics software versions provided in the table below.*

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RECOMMENDED AVIONICS DATA LINK SOFTWARE VERSIONS

<table>
<tr><th colspan="4">Recommended software versions for NAT data link operations</th></tr>
<tr><th>Aircraft type</th><th>FANS software</th><th>ACARS software</th><th>Notes</th></tr>
<tr><td>A318/A319/A320/A321</td><td>CSB7.4 or CSB9</td><td>CSB7.4 or CSB9</td><td>Aircraft with Thales FMS: S8</td></tr>
<tr><td>A330/A340</td><td>CLR7.4 or CLR9</td><td>CLR7.4 or CLR9</td><td>Aircraft with Thales FMS: T6</td></tr>
<tr><td>A350</td><td>CLV1.3.1</td><td>S4</td><td></td></tr>
<tr><td>A380</td><td>CLA4.1</td><td>S2.1</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>MD11</td><td>FMS Pegasus -923</td><td rowspan="8">Refer to applicable Service Bulletins and/or STCs</td><td></td></tr>
<tr><td>B736/7/8/9</td><td>FMS U11, U12, or U13</td><td></td></tr>
<tr><td rowspan="2">B744</td><td>With original FMS: Load 16</td><td></td></tr>
<tr><td>With B748 FMS: BPV4.0</td><td></td></tr>
<tr><td>B748</td><td>FMS BPV4.0</td><td></td></tr>
<tr><td>B75x</td><td rowspan="2">Pegasus I FMC – Peg ‘09
Pegasus II FMC – BP1</td><td></td></tr>
<tr><td>B76x</td><td></td></tr>
<tr><td rowspan="2">B77X</td><td colspan="2">With AIMS-1: BPV16</td><td></td></tr>
<tr><td colspan="2">With AIMS-2: BPV17a.1</td><td></td></tr>
<tr><td>B78X</td><td colspan="2">CMF BPV5</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Beechcraft 4000</td><td>Universal Avionics UNS-1</td><td>Universal Avionics UniLink UL-80X SCN 30.4</td><td>3rd party STCs</td></tr>
<tr><td>Bombardier Learjet 35, 36, 35A, 36A, 40, 40XR, 45, 45XR, 60, 60XR</td><td>Universal Avionics FMS SCN 1002.1</td><td>Universal Avionics UniLink UL-80X SCN 31.3</td><td></td></tr>
<tr><td>Bombardier Challenger 300, 350</td><td>Collins Proline 21 Advanced</td><td>Collins RIU-4000</td><td></td></tr>
<tr><td>Bombardier Challenger 600, 601, 601-1A, 601-3A, 601-3R, 604</td><td>Universal Avionics FMS SCN 1002.1</td><td>Universal Avionics UniLink UL-80X SCN 31.3</td><td></td></tr>
</table>

Recommended software versions for NAT data link operations			
Aircraft type	**FANS software**	**ACARS software**	**Notes**
Bombardier Challenger 600, 601, 601-1A, 601-3A, 601-3R	Honeywell NZ6.1.1	Honeywell CMU MK II+	
Bombardier Challenger 605, 650	Collins Proline 21 Advanced	Collins CMU-4000	
Bombardier Global 5000 GVFD	Collins Proline Fusion	Collins DLCA-6000	
Bombardier Global 6000	Collins Proline Fusion	Collins DLCA-6000	
Bombardier Global Express, Global Express XRS, Global 5000	Honeywell NZ6.1.1	Refer to applicable Service Bulletins/STCs	
Bombardier Global 7500	Collins Proline Fusion	Collins DLCA-6000	
Dassault F50, F50EX	Universal Avionics UNS-1	Universal Avionics UniLink UL-80X SCN 30.4	3rd party STCs
Dassault F50, F50EX	Honeywell NZ6.1.1	Honeywell CMU MK II+	3rd party STCs
Dassault F2000	Universal Avionics UNS-1	Universal Avionics UniLink UL-80X SCN 30.4	3rd party STCs
Dassault F2000 DX/EX/LX/S	Honeywell EPIC NZ7.1.2	Honeywell EPIC CMF 2.51	EASy II 4th Cert
Dassault F900, F900B, F900C, F900EX	Honeywell NZ6.1.1	Honeywell CMU MK II+	
Dassault F900 DX/EX/LX	Honeywell EPIC NZ7.1.2	Honeywell EPIC CMF 2.51	EASy II 4th Cert
Dassault F900B	Universal Avionics UNS-1	Universal Avionics UniLink UL-80X SCN 30.4	3rd party STCs
Dassault F7X	Honeywell EPIC NZ7.1.2	Honeywell EPIC CMF 2.51	EASy II 4th Cert
Dassault F8X	Honeywell NGFMS	Honeywell EPIC CMF 3.0	EASy III 2nd Cert
Embraer E135/145 "Legacy 600/650" business jet version	Honeywell NZ6.1.1	Honeywell CMU MK III Bld 1.29	
Embraer E170/190 "Lineage 1000" business jet version	Honeywell NGFMS	Honeywell EPIC CMF 3.0	
Embraer E170/175/190/195	Honeywell NGFMS	Honeywell EPIC CMF 3.0	
Embraer E2-190/195	Honeywell NGFMS	Honeywell EPIC CMF 3.3	
Gulfstream G100	Universal Avionics UNS-1	Universal Avionics UniLink UL-80X SCN 30.4	3rd party STCs
Gulfstream G150	Universal Avionics UNS-1	Universal Avionics UniLink UL-80X SCN 30.4	Gulfstream STC
Gulfstream G200	Collins Proline 4 (FMC SW 4.0)	Collins CMU-1000	Gulfstream STC

Recommended software versions for NAT data link operations			
Aircraft type	**FANS software**	**ACARS software**	**Notes**
Gulfstream G200	Universal Avionics UNS-1	Universal Avionics UniLink UL-80X SCN 30.4	Gulfstream STC
Gulfstream G200	Universal Avionics UNS-1	Universal Avionics UniLink UL-80X SCN 30.4	3rd party STCs
Gulfstream G280	Collins Proline Fusion	DLCA-6000	Production Standard
Gulfstream GII, GIIB, GIII	Honeywell NZ6.1.1	Honeywell CMU MK III Bld 1.29	3rd party STCs
Gulfstream GII, GIIB, GIII	Universal Avionics UNS-1	Universal Avionics UniLink UL-80X SCN 30.4	3rd party STCs
Gulfstream G450	Honeywell EPIC NZ7.1.2	Honeywell EPIC CMF 2.6	(ASC 912B)
Gulfstream G550	Honeywell EPIC NZ7.1.2	Honeywell EPIC CMF 2.6	(ASC 912B)
Gulfstream GIV, GIV-SP	Honeywell NZ6.1.1	Honeywell CMU MK III Bld 1.29	
Gulfstream GV, GV-SP	Honeywell NZ6.1.1	Honeywell CMU MK III Bld 1.29	
Gulfstream G650	Honeywell NGFMS	Honeywell EPIC CMF 3.0	(ASC 902B)
Gulfstream G500	Honeywell NGFMS	Honeywell EPIC CMF 3.1	(Type Cert)
Gulfstream G600	Honeywell NGFMS	Honeywell EPIC CMF 3.1	(Type Cert)

APPENDIX T — UPDATE OF CONSOLIDATED REPORTING RESPONSIBILITIES HANDBOOK – NORTH ATLANTIC REGION, (NAT DOC 010)

(*paragraph 5.6.3 refers*)

STARTS ON NEXT PAGE

APPENDIX T — UPDATE OF CONSOLIDATED REPORTING RESPONSIBILITIES HANDBOOK – NORTH ATLANTIC REGION, (NAT DOC 010)

(*paragraph 5.6.3 refers*)

European and North Atlantic Office

NAT DOC 010

Consolidated Reporting Responsibilities Handbook

North Atlantic Region

~~Provisional Edition –~~ June 201~~5~~9

Prepared by the ICAO European and North Atlantic Office

on behalf of the North Atlantic Safety Oversight Group (NAT SOG)

EUROPEAN AND NORTH ATLANTIC OFFICE OF ICAO

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1. FOREWORD

This document is for guidance only. Regulatory material relating to North Atlantic Region (NAT) operations is contained in relevant *ICAO Annexes*, *PANS-ATM (ICAO Doc 4444), Regional Supplementary Procedures (ICAO Doc 7030)*, State *Aeronautical Information Publications (AIPs)* and current Notices to Airmen (NOTAMs), which should be read in conjunction with the material contained in this document.

1.1 This document is primarily for the information of the ICAO North Atlantic Region States and their air navigation service providers (ANSPs). It compiles relevant reporting requirements and guidance in response to the NAT Systems Planning Group (NAT SPG), **Conclusion 48/20 - Consolidated ICAO NAT Region safety occurrence reporting requirements document,** which directed the NAT Safety Oversight Group (NAT SOG) to develop a document in which all region-specific safety occurrence reporting requirements are consolidated~~ for presentation to NAT SPG/49. The NAT SPG agreed the document would cover not only incidents, errors and data, but take account of the relationship between the NAT Data Link Monitoring Agency (NAT DLMA) and the NAT CMA~~.

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1.2 This manual has been produced on behalf of the NAT SPG; a North Atlantic regional planning body established under the auspices of the International Civil Aviation Organization (ICAO). This group is responsible for developing operational requirements, specifying the necessary services and facilities, and defining the aircraft and operator approval standards employed in the NAT Region. Further information on the functions and working methods of the NAT SPG, together with the NAT Regional Safety Policy Statement, are contained in the NAT SPG Handbook, which is available from the ICAO website: under "Regional Offices," "Paris," the location of the European and North Atlantic Regional Office.

1.3 This document can be accessed and downloaded from the ICAO website http://portal.icao.int/ as described in the paragraph above. This website will also include any noted post publication errata (changes) or addenda (additions) to the current edition. The document will be reissued on a recurrent basis as needed.

1.4 To assist with the editing of this manual and to ensure the currency and accuracy of future editions it would be appreciated if readers would submit their comments and/or suggestions for possible amendments and/or/additions to the ICAO EUR/NAT Office at the email address: icaoeurnat@paris.icao.int.

~~2. ANNOTATED BIBLIOGRAPHY~~

~~2.1 This document compiles relevant region-specific reporting requirements and guidance related to events or occurrences within the ICAO NAT Region. Below is an annotated bibliography that summarizes the reporting requirements used to develop this manual.~~

- ~~***Annex 19, Safety Management Systems,*** outlines the Standards and Recommended Practices (SARPs) are applicable to safety management functions related to, or in direct support of, the safe operation of aircraft. Chapter 5 – Safety Data Collection, Analysis and Exchange, outlines the specifications to support **safety** management activities by collection and analysis of safety data and by exchange of safety information, as part of the State Safety Program (SSP). It is complemented by Attachment B - Legal guidance for the protection of information from safety data collection and processing systems.~~

- ~~***Procedures for Air Navigation Services, Air Traffic Management (PANS-ATM) (Doc 4444)***, paragraph 16.3 requires occurrences such as aircraft proximity (AIRPROX) or other serious difficulty resulting in a hazard to aircraft caused by (among others, faulty procedures, non-compliance with procedures, or failure of ground facilities) to be reported. The document also provides a model air traffic incident report which is helpful for determining degree of risk involved in an aircraft proximity incident.~~

- ~~***NAT Regional Supplementary Procedures (Doc 7030)*** establishes the target level of safety (TLS) in each dimension and ***requires*** the safety level to be determined by an appropriate safety assessment as described in the *Manual on Airspace Planning Methodology for the Determination of Separation Minima (Doc 9689)*, *the Safety Management Manual (SMM) (Doc 9859)* and Annex 19.~~

- ~~***Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part I*** *— Organization and Planning,* contains guidance material concerning the preparation of notification messages and the arrangements to be made for their prompt delivery to the addressee. It also includes a sample notification.~~

- ~~***Manual on a 300 m (1 000 ft.) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574)*****,** provides regional planning groups with a basis for the revision of documents, procedures and programs to enable the maintenance of a 300 m (1 000 ft.) VSM, between FL 290 and FL 410 inclusive within their particular regions in accordance with the criteria and requirements developed by ICAO. This manual also provides: guidance to State aviation authorities on those measures necessary to ensure that the criteria and requirements are met within their area of responsibility and background information for operators for the development of operating manuals and flight crew procedures. It indicates that there is a need for system performance monitoring during planning, implementation and operational use of RVSM.~~

- ~~***Regional Monitoring Agency Manual*** was issued in May 2004 in response to Doc 9574, *Manual on a 300 m (1 000 ft.) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive*. In all regions where RVSM has been implemented, Regional Monitoring Agencies (RMA) have been established by the appropriate Planning and Implementation Regional Groups (PIRGs) to undertake the functions described in this manual. The objectives of the RVSM monitoring programme include, inter alia:~~

  ~~a) verification that the RVSM approval process remains effective;~~

  ~~b) verification that the target level of safety will be met on implementation of RVSM, and will continue to be met thereafter;~~

  ~~c) monitoring the effectiveness of the altimetry system modifications which have been implemented to enable aircraft to meet the required height-keeping performance criteria; and~~

  ~~d) evaluation of the stability of altimetry system error (ASE).~~

  ~~The Regional Monitoring Agency Manual was developed to provide guidance for RMAs in the performance of these functions.~~

- ~~***Air Traffic Services Planning Manual (Doc 9426)*** was published in 1984 to supplement the provisions governing ATS as specified in Annex, Rules of the Air, Annex 11, Air Traffic Services and PANS ATM, Part II, Chapter 3, ATS Incident Reporting, is concerned with the reporting and investigation of an air traffic incident, i.e., an occurrence involving air traffic such as a near collision, a difficulty caused by faulty procedures, the lack of compliance with applicable procedures, or a failure of ground facilities resulting in a hazard to aircraft. It also reproduces a form for use by pilots and controllers when submitting or receiving a report regarding an air traffic incident. In Part II- Methods of application employed by Air Traffic Services, Section 2, Chapter 4- Minimum navigation performance specifications, the manual explains that "States of Registry which have approved MNPS operations should continue to monitor operations so approved." It also explains why the Central Monitoring Agency was developed, i.e., in part to determine whether a general or partial degradation of navigation performance was taking place and what corrective action is required.~~

- ~~***Safety Management Systems Manual (Doc 9859)*** is intended to provide States with guidance for the development and implementation of a State Safety Programme (SSP), in accordance with the International Standards and Recommended Practices (SARPs) contained in Annex 1 — Personnel Licensing, Annex 6 — Operation of Aircraft, Annex 8 — Airworthiness of Aircraft, Annex 11 — Air Traffic Services, Annex 13 — Aircraft Accident and Incident Investigation and Annex 14 — Aerodromes, Volume I — Aerodrome Design and Operations. It explains the need for States to implement a SSP). Element 3.2 Safety data collection, analysis and exchange) which ensures the capture and storage of data on hazards and safety risks at both an individual and aggregate State level, as well as to establish mechanisms to develop information from the stored data, and to actively exchange safety information with service providers and/ or other States as appropriate.~~

- ~~***North Atlantic operations and airspace manual (NAT Doc 007)*** explains that as the result of 60NM lateral separation minima, special importance will have to be placed on monitoring and assessment of navigation performance. It was therefore agreed that there was a need to collect, collate and circulate to States participating in the monitoring programme, data regarding navigation performance in the NAT Region. To meet this requirement, the NAT CMA was established. The document captures relevant ICAO SARPs and guidance.~~

- ~~***NAT SPG Conclusions***. Any reporting requirements agreed to by the Member States that make up the NAT SPG as outlined in its conclusions from its first meeting in 1965 to its forty-ninth meeting in June 2013, are referenced in the table. One-time reporting requests or requirements are not included. The NAT reporting requirements have gradually expanded to meet the needs of system risk assessments, understanding of operational errors, and informing the safety assessments involved with reductions in separation. The SPG conclusions tend to supplement the documents above and add a measure of regional standardization.~~

2. Region-Specific Reporting Responsibilities

~~Report the following to the NAT CMA in a timely manner if the event occurred in NAT oceanic airspace~~HLA ~~via email, or the North Atlantic Deviations and Error Monitoring Application (NAT DEMA)~~ Report vertical deviations of 90m (300ft) or more, lateral deviations, and longitudinal losses of separations with the following data to the NAT CMA in a timely manner if the event occurred in the NAT HLA via email, or the North Atlantic Deviations and Error Monitoring Application (NAT DEMA)

MINIMUM DATA TO BE PROVIDED TO THE NAT CMA
event type
date and time the event occurred
start and end locations of the occurrence, where available
whether the event occurred on the NAT OTS
aircraft identification, type, departure and destination
assigned flight level and, if different, the observed flight level
assigned speed and, if different, the observed or reported speed
assigned route and if different, the observed or reported route, including for a subsequent route portion not yet flown
details of Loss of Separation
flight plan
FDPS System Logs
communications or surveillance mode used to detect the event (i.e. Mode C, ADS-B, ADS-C, pilot report, etc.)
an initial event summary
Operator responses, findings and conclusions (including causes and contributory factors) arising from the unit's investigation of the event

~~Type of Information~~	~~Contents:~~	~~Reference~~

~~**Incidents**~~ ~~Near-collisions requiring an avoidance maneuver to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.~~ ~~[ACAS RA events]~~ ~~**Occurrences/Events**~~ ~~Non-MNPS Certified aircraft in MNPS airspace~~ ~~Any actual deviation from the cleared track (SLOP (strategic lateral offset procedure) is not a deviation)~~ ~~A Gross Navigation Error (GNE)~~ ~~An ATC Intervention~~ ~~An ATC Prevention~~ ~~Turnback or contingency procedure~~ ~~Instances of poor or non-existent co-ordination~~ ~~Large Height Deviations (LHD)~~ ~~Time/speed-related Errors~~ ~~Incorrect application of SLOP~~ ~~Losses of separation~~ ~~Erosion of longitudinal separation in MNPS of 3 mins or more~~ ~~Discrepancies of 5 minutes or more between an ETA/ATA at a waypoint~~ ~~Erosions of lateral separations~~ ~~ATC loop errors and incorrect clearances~~ ~~Deviations due to MET conditions~~ ~~NOTE: The CMA will forward to the DLMA any report described above that involves data link issues per NAT SPG conclusion 48/17~~	~~a) event type; b) date the event occurred;~~ ~~c) start and end times and locations (expressed as latitude/longitude) of the occurrence;~~ ~~d) location where the event occurred;~~ ~~e) type of airspace involved (i.e. MNPS, below MNPS, etc.);~~ ~~f) whether the event occurred within, north or south of the NAT OTS;~~ ~~g) type of aircraft operation (i.e. commercial, general aviation or military);~~ ~~h) operator name;~~ ~~i) aircraft identification, type, departure and destination;~~ ~~j) assigned flight level and, if different, the observed flight level;~~ ~~k) whether or not the aircraft entered the reporting OCA at an uncoordinated flight level;~~ ~~l) assigned speed and, if different, the observed or reported speed;~~ ~~m) assigned route and if different, the observed or reported route, including for a subsequent route portion not yet flown;~~ ~~n) flight plan;~~ ~~o) if applicable, the duration at uncleared flight level;~~ ~~p) if applicable, the duration at uncleared speed;~~ ~~q) type(s) of communication being used at the time of the occurrence;~~ ~~r) identification of the unit, flight information region or sector from which the flight entered the OCA of the unit providing the report;~~ ~~s) communications or surveillance mode used to detect the event (i.e. Mode C, ADS-B, ADS-C, pilot report, etc.);~~ ~~t) whether the flight crew was advised of the event;~~ ~~u) any comments provided by the flight crew;~~ ~~v) whether the event was reported to the NAT DLMA;~~ ~~w) if applicable, whether or not the appropriate contingency procedure(s) was(were) followed;~~ ~~x) if the applicable contingency procedure was not followed, details concerning the action taken by the flight;~~ ~~y) an initial event summary (to be included with the initial report to the NAT CMA);~~ ~~z) findings and conclusions (including causes and contributory factors) arising from the unit's investigation of the event;~~ ~~aa) when applicable, the name of the unit(s) whose breakdown in procedure led to the event;~~ ~~bb) corrective actions taken in response to the event; and~~ ~~cc) mitigations, if any, put in place to address the event.~~	~~-For required content of the report, see NAT SPG Conclusion 48/19 and 22, Appendix L.~~ ~~-See NAT Doc 001, for occurrence reporting codes.~~ ~~-When notifying air operators of an occurrence include the OESB per NAT SPG 49/15;~~ ~~-Additional requirements are referenced in at least the following documents: for no-MNPS cert. aircraft in MNPS airspace, see ; or non-HF equipped aircraft, see ; for deviations see **NAT SPG 48/21;** for turnback or contingency reporting see SPG **41/4;** for poor or non-existent coordination, see **NAT SPG 41/15**; for reporting LHD, see the RMA manual of 2004 and **SPG 38/10;** for time/speed related errors see **SPG 48/22, App. L;** for contingency procedures see **SPG 41/4**; for incorrect application of SLOP, see **NAT Doc. 007 par.11.7.14**; for losses of separation, see **Doc. 4444 par. 16.3;** for erosion of long. separation and discrepancies of 5 minutes or more see **NAT Doc. 007 par. 11.7.14;** for erosions of lateral separations see ; for loop errors, incorrect clearances, deviations due to MET, see **Doc 9574**; Timeframe: with the least possible delay, per **Doc 007 par. 11.7.12**~~

~~As new mitigations are implemented, report them to the NAT CMA via email or through the North Atlantic Deviations and Error Monitoring Application (NAT DEMA)~~

~~Type of Information~~	~~Contents:~~	~~Reference~~
~~Implementation of new mitigations (to vertical risk) and report the effects~~	~~Explain the implementation of new mitigations to vertical risk and report the effects (share best practices)~~	~~NAT SPG conclusion 41/20~~

Report to ~~the United Kingdom National Air Traffic Services, Ltd. (NATs UK)~~ Wake.WakeTurbulence@nats.co.uk and natcma@nats.co.uk

Type of Information	Contents:	Reference
Wake Turbulence Events	Use the Wake Turbulence Reporting Form Information goes into the Wake Vortex database ~~and is compiled and sent to the CMA periodically~~	North Atlantic ~~operations~~ Operations and ~~airspace~~ Airspace ~~manual~~ Manual (NAT Doc 007) Attachment 3

Report traffic activity data ~~from the 4th and 15th day of each month~~ to NAV Canada.

Type of Information	Contents:	Reference
Traffic Activity Data	~~i) operator and aircraft type,~~ ~~time, position, level and assigned Mach number from all compulsory reporting points (waypoints), including oceanic entry and oceanic exit points;~~ ~~ii) estimated time of arrival at each subsequent waypoint to the waypoints listed in i), except the oceanic exit point; and~~ ~~iii) suitable identification, e.g., registration or other unique indication, so that the disparate data sources can be combined;~~ ~~iv) in comma-separated-variable (CSV) format~~ i. Gregorian Date, Julian Day and Year for the Oceanic Control Area Entry Date; ii. Flight Registration, Class, Aircraft Type and Equipment; iii. Direction, Track, Origin and Destination;	NAT SPG conclusion 55/XX~~48/17~~

~~Report the following to the NAT MWG, estimates proposed annually, using a 24-hour day annual sample comparing Reykjavik, Gander, and Shanwick daily traffic.~~

~~Type of Information~~	~~Contents:~~	~~Reference~~
~~Traffic Count (for the determination of future estimates of lateral error rates)~~		~~NAT SPG Conclusion 44/19~~

Report the following to the DLMA through the website, http://www.fans-cra.com/ ~~http://www.ispacg-cra.com.~~

Type of Information	Contents:	Reference
Data Link Issues	Required content: http://www.fans-cra.com/ ~~http://www.ispacg-cra.com.~~	NAT SPG Conclusion 46/3

Note: in some cases a report may be required (depending on the nature of the event) to both the DLMA and CMA.

~~OCCURRENCE CLASSIFICATION CODES~~

~~General~~

~~CF~~	~~Communications failure~~
~~CI~~	~~Crew Injury~~
~~CR~~	~~Crew Request~~
~~CW~~	~~Cracked window~~
~~DW~~	~~Destination Weather~~
~~ED~~	~~Engine Defect~~
~~ES~~	~~Engine Shutdown~~
~~F~~	~~Fire~~
~~FL~~	~~Fuel Leak~~
~~FPD~~	~~Fuel Pump Defect~~
~~FS~~	~~Fuel shortage~~
~~HP~~	~~Hydraulic Problem~~
~~IRSF~~	~~IRS Failure~~
~~LFT~~	~~Low Fuel Temperature~~
~~ME~~	~~Medical Emergency~~
~~PD~~	~~Passenger Disturbance~~
~~PEI~~	~~Precautionary Engine Indication~~
~~PR~~	~~Pressurisation problem~~
~~S~~	~~Smoke~~
~~SIC~~	~~Smoke in Cockpit~~
~~TP~~	~~Technical Problem~~
~~W~~	~~Weather~~

~~Contingency Action~~	~~CA~~
~~CF~~	~~Communications failure~~
~~CI~~	~~Crew Injury~~
~~CR~~	~~Crew Request~~
~~CW~~	~~Cracked window~~
~~DW~~	~~Destination Weather~~
~~ED~~	~~Engine Defect~~
~~ES~~	~~Engine Shutdown~~
~~F~~	~~Fire~~
~~FL~~	~~Fuel Leak~~
~~FPD~~	~~Fuel Pump Defect~~
~~FS~~	~~Fuel shortage~~
~~HP~~	~~Hydraulic Problem~~
~~IRSF~~	~~IRS Failure~~
~~LFT~~	~~Low Fuel Temperature~~
~~ME~~	~~Medical Emergency~~
~~PD~~	~~Passenger Disturbance~~
~~PEI~~	~~Precautionary Engine Indication~~
~~PR~~	~~Pressurisation problem~~
~~S~~	~~Smoke~~
~~SIC~~	~~Smoke in Cockpit~~
~~TP~~	~~Technical Problem~~
~~W~~	~~Weather~~

~~Diversion~~	~~DIV~~
~~D~~	~~Failed to comply with restriction in clearance~~
~~L~~	~~ATC error~~

~~Horizontal Separation Erosion~~	~~HSE~~
~~C~~	~~Crew error~~
~~ISO~~	~~Followed flight plan iso clearance~~
~~L~~	~~ATC error~~
~~L4~~	~~ATC Co-ordination error~~

~~Intervention~~	~~INT~~
~~A~~	~~Committed by aircraft not certified for operation in MNPS airspace~~
~~B1~~	~~ATC Loop Error - Controller error~~
~~B2~~	~~ATC Loop Error - Poor information exchange between CONTROLLER and the third party communicator~~
~~B3~~	~~ATC Loop Error - Poor information exchange between PILOT and the third party communicator~~
~~B4~~	~~ATC Loop Error - Poor centre to centre co-ordination~~
~~C~~	~~Crew error~~
~~C1~~	~~Equipment control error encompassing incorrect operation of fully functional FMS or navigation system.~~
~~C2~~	~~Incorrect transcription of ATC clearance or re-clearance into the FMS.~~

~~C3~~	~~Wrong information faithfully transcribed into the FMS e.g. flight plan followed rather than ATC clearance or original clearance followed instead of re-clearance~~
~~D~~	~~Other with failure to notify ATC in time for action~~
~~E~~	~~Other with failure to notify ATC too late for action~~
~~F~~	~~Other with failure not notified/received by ATC~~
~~G~~	~~Inter-facility co-ordination problem~~
~~ISO~~	~~Followed flight plan iso clearance~~
~~L~~	~~ATC error~~
~~W~~	~~Weather~~
~~Lateral Deviation <25nm~~	~~L~~
~~Lateral Deviation <15nm~~	~~L15~~
~~A~~	~~Committed by aircraft not certified for operation in MNPS airspace~~
~~B1~~	~~ATC Loop Error - Controller error~~
~~B2~~	~~ATC Loop Error - Poor information exchange between CONTROLLER and the third party communicator~~
~~B3~~	~~ATC Loop Error - Poor information exchange between PILOT and the third party communicator~~
~~B4~~	~~ATC Loop Error - Poor centre to centre co-ordination~~
~~C1~~	~~Equipment control error encompassing incorrect operation of fully functional FMS or navigation system.~~

~~**C2**~~	~~Incorrect transcription of ATC clearance or re-clearance into the FMS.~~
~~**C3**~~	~~Wrong information faithfully transcribed into the FMS e.g. flight plan followed rather than ATC clearance or original clearance followed instead of re-clearance~~
~~**D**~~	~~Other with failure to notify ATC in time for action~~
~~**E**~~	~~Other with failure to notify ATC too late for action~~
~~**F**~~	~~Other with failure not notified/received by ATC~~
~~**G**~~	~~Inter-facility co-ordination problem~~
~~**W**~~	~~Weather~~

~~**GROSS NAVIGATION ERRORS**~~

~~The GNE occurred in MNPS airspace and the aircraft was observed exiting the ocean through the windows and the deviation >= 30Nm.~~

~~Alpha (eta)~~

~~**The GNE occurred in MNPS airspace and the aircraft was observed exiting the ocean through the windows and the deviation >= 50Nm or >= 1 deg., as appropriate.**~~

~~**Alpha (zeta, risk- bearing)**~~

	~~The GNE occurred in MNPS airspace, was NOT observed exiting the ocean through the windows and the deviation >=25Nm or WAS observed exiting the ocean through the windows and the deviation>=30Nm.~~	~~B~~
	~~The GNE occurred above or below MNPS airspace (not necessarily at the windows) and the deviation >=25Nm~~	~~C~~
~~**C**~~	~~Crew error~~	
~~**D**~~	~~Failed to comply with restriction in clearance~~	
~~**E**~~	~~Climb/descent without ATC clearance.~~	
~~**L**~~	~~ATC error~~	
~~**W**~~	~~Weather~~	
	~~**Longitudinal Separation Erosion**~~	~~LSE~~
~~**C**~~	~~Crew error~~	
~~**L**~~	~~ATC error~~	
~~**MA**~~	~~Mach no.~~	
~~**WP**~~	~~Waypoint~~	
	~~**Time-Related Incident**~~	~~TRI~~
~~**CF**~~	~~Communications failure~~	
~~**CI**~~	~~Crew Injury~~	

~~**CR**~~	~~Crew Request~~
~~**CW**~~	~~Cracked window~~
~~**DW**~~	~~Destination Weather~~
~~**ED**~~	~~Engine Defect~~
~~**ES**~~	~~Engine Shutdown~~
~~**F**~~	~~Fire~~
~~**FL**~~	~~Fuel Leak~~
~~**FPD**~~	~~Fuel Pump Defect~~
~~**FS**~~	~~Fuel shortage~~
~~**HP**~~	~~Hydraulic Problem~~
~~**IRSF**~~	~~IRS Failure~~
~~**LFT**~~	~~Low Fuel Temperature~~
~~**ME**~~	~~Medical Emergency~~
~~**PD**~~	~~Passenger Disturbance~~
~~**PEI**~~	~~Precautionary Engine Indication~~
~~**PR**~~	~~Pressurization problem~~
~~**S**~~	~~Smoke~~
~~**SIC**~~	~~Smoke in Cockpit~~
~~**TP**~~	~~Technical Problem~~
~~**W**~~	~~Weather~~

~~**Turnback**~~ ~~TB~~

~~**A**~~ ~~Contingency action due to engine fault~~

~~**B**~~ ~~Contingency action due to pressurization failure~~

~~**C**~~ ~~Contingency action due to other cause~~

~~**D**~~ ~~Failure to climb/descend as cleared~~

~~**E**~~ ~~Climb/descent without ATC clearance~~

~~**F**~~ ~~Entry to RVSM airspace at an incorrect level~~

~~**G**~~ ~~ATC FL re-clearance resulting in a loss of lateral or longitudinal separation~~

~~**H**~~ ~~Deviation due to TCAS~~

~~**I**~~ ~~Aircraft unable to maintain level~~

~~**J**~~ ~~ATC failure to correctly record, coordinate, or follow through on FL changes and/or other clearances.~~

~~**K**~~ ~~Aircrew not maintaining level as cleared.~~

~~**L1**~~ ~~ATC failure to capture incorrect read back of control instructions.~~

~~**L2**~~ ~~ATC failure to maintain situational awareness~~

~~**L3**~~ ~~ATC failure to resolve transposed call signs~~

~~**L4**~~ ~~ATC Co-ordination error~~

~~**M**~~ ~~Actions taken due to mechanical or equipment failure~~

~~**O**~~ ~~Other~~

~~**W**~~ ~~Weather~~

~~Final level within RVSM airspace~~ ~~1~~

~~Final level above RVSM airspace~~ ~~2~~

~~Final level below RVSM airspace~~ ~~3~~

– END –

APPENDIX U — NAT 2030 VISION HIGH-LEVEL PRINCIPLES, GOALS AND OBJECTIVES AND POTENTIAL IMPROVEMENT AREAS

(*paragraph 6.1.3 refers*)

1. NAT 2030 Vision High-Level Principles

a) Enable the traffic growth in a safe, efficient and proportionate manner based on performance based measurable outcomes;
b) Meet NAT safety targets, including TLS;
c) Enable the NAT airspace such that is has the ability to safely integrate all airspace users, e.g. new entrants providing them with predictable, flexible and optimum trajectories and flight planning;
d) Not only achieve the needs of the Region but also those of the GANP and the GASP, as well as environmental objectives, to achieve the optimum benefits and desired outcomes;
e) Harness the new industry, operational and technology innovate developments to deliver proportionate and measurable safety, service, efficiency and environmental benefits;
f) Proportionally exploit new and or enhanced data capabilities across the region to improve the safety, predictability and or efficiency of the Operations;
g) Consider Human Factors as central part of the 2030 CONOPS;
h) Implementations based on solid CBA;
i) Look beyond 2030, potentially up to 2040;
j) Ensure civil/military coordination;
k) Integration of all stakeholders in collaborative decision making and use of big data computation.

2. NAT 2030 Vision Goals/Objectives

Goals	Objectives
Ensured as far as possible that all NAT developments are implemented in the context of “seamless boundaries”	Take full account of the other regional environments such that we have seamless operational boundaries
Enhanced flexibility of NAT Operations	Any operational or other constraints, e.g. OTS, will be regularity reviewed with the intent of removal of any that are deemed no longer necessary
Enhanced the resilience and predictability of the NAT wide operations	Weather and other operational impacting events are managed through appropriate and agreed plans with the minimum of operational impact. We have consistently adopted across the NAT new advanced tools to enhance our proactive management of potentially operational impacting events The NAT Contingency procedures are continually reviewed to take account of the developing understanding of NAT aviation vehicles technical resilience. Resilience of communications infrastructure is ensured
Continued cooperation with all adjacent regions and industry wide stakeholders to achieve seamless boundaries	All stakeholders will be engaged in the development and implementation of the Development Roadmap to ensure all operational and technical capabilities are appropriately exploited

Goals	Objectives
The NAT operations takes account of both the prevailing and forecast operational and stakeholders capabilities and implements proportionate performance based outcomes	New technology will be supported by an agreed Concept of Operations and a safe and cost effective solution We will optimise utilisation of current capabilities whilst ensure all new developments do not inadvertently impact prevailing capabilities The development roadmap will be continually validated to ensure it remains relevant
Our technology roadmap is aligned to the practical capabilities that will exist to 2030	Maximised benefits from available technologies
Safety, Service, Value and Environment benefits are measurable using representative metrics and are part of not only the business case for all developments but are used to monitor the NAT performance as a whole.	Performance based metrics and meeting the NAT safety targets, including TLS, as well as any other future performance targets

3. NAT 2030 Vision Potential Improvement Areas

Note: The List of Potential Improvement Areas below include inputs provided post-Workshop in highlighted text.

a) Ensure optimal use of the currently available technology as this will continue to be in use by 2030, in particular, pursue further improvements to FANS 1/A system and prepare to ATN B2;

b) Space-based ADS-B surveillance (work already in progress);

c) Only apply speed restrictions when needed for separation (OWAFS) (work already in progress);

d) Discontinue oceanic clearances;

e) Use of aircraft downlink parameters (ex: pilot selected level);

f) Reduce the footprint of the OTS (lateral, vertical and time period) and consider the use of User Preferred Routings UPR;

g) SATVOICE – migration from HF voice to SATVOICE as backup to FANS;

h) Strategic vs Tactical control/Reduced conflict probe horizon *(The use of reliable communications and surveillance to eliminate the need for clearances to define conflict-free profiles which extend all the way to landfall. Rather, conflicts will be progressively resolved over the duration of the flight.)*;

i) Dynamic Airborne Rerouting Procedure DARP;

j) Consider RVSM above F410;

k) Implement SWIM and FF-ICE;

l) Consider space weather factors as part of contingency procedures;

m) Consider formation flights;

n) Self-separation;

o) Accommodation of new entrants (e.g. supersonic aircraft, UAS and UTM, balloons, operations above FL460);

p) Need for resilience of COM systems, SATVOICE migration, digital HF developments and space-based VHF;

q) Improvements to end-to-end performance to meet at least RCP 240 and RSP 180, including their associated SRs;

r) Address the regulatory oversight of CSPs and SSPs;

s) Ensure systems cybersecurity and resilience.

APPENDIX V — STATUS OF NAT SPG, NAT IMG AND NAT SOG PROJECT TEAMS

(paragraph 6.5.1 refers)

	Reporting as of :			17 June 2019					
Created at	**Project Team**	**Parent Group**	**Supervisor**	**Project Title**	**Start date**	**End date**	**Lead**	**Report**	**Progress Status**
NAT SOG Dec 20/01	NAT PBCS NPRH PT	NAT SOG	NAT SOG	NAT PBCS non-performance reporting harmonization Project Team	07/01/2019	13/12/2019	NAT SOG Chair	NAT SOG/21	On-going
NAT SOG Dec 20/04	NAT ADS-B HMS PT	NAT SOG	NAT SOG	NAT ADS-B Height Monitoring Systems (HMS) Trial Project Team	07/06/2019	13/12/2019	NAT CMA	NAT SOG/21	On-going
NAT SOG Dec 20/06	NAT RHI PT	NAT SOG	NAT SOG	Regional Hazard Identification Project Team (NAT RHI PT)	07/06/2019	13/12/2019	UK CAA	NAT SOG/21	On-going
NAT EFFG/35	NAT TFM	NAT EFFG	NAT EFFG	NAT Traffic Forecast Methodology Project Team	01/11/2018	30/05/2019	NAT EFFG Chair	NAT EFFG/37	On-going
NAT IMG Dec 54/4	SATVOICE PT	NAT TIG	NAT IMG	NAT SATVOICE	01/05/2019	30/04/2020	Shelley Bailey (Canada)	NAT IMG/56	On-going
NAT POG/06	OCR PT	NAT POG	NAT POG	NAT Oceanic Clearance Removal (OCR) PT	01/09/2018	01/04/2019	Canada	NAT IMG/56	On-going
NAT IMG Dec 52/9	NODAR PT	NAT TIG	NAT TIG	NAT Network Outage Detection and Reporting (NODAR)	01/04/2018	30/03/2019	Theresa Brewer, United States	NAT TIG/7	On-going
NAT SPG/54 Con 54/11	NAT DEMA RPT	NAT SPG	NAT SOG	NAT DEMA Replacement Project Team (NAT DEMA RPT)	01/07/2018	30/06/2019	Carolyn Read, NAT CMA	NAT SOG/20	Completed
NAT SOG Dec 19/01	NAT SCC PT	NAT SPG	NAT SOG	NAT Safety Case Components Project Team (NAT SCC PT)	07/01/2019	01/05/2019	Hlin HOLM, Iceland	NAT SOG/20	Completed
NAT SOG dec 19/11	NAT HMS PT	NAT SPG	NAT SOG	NAT Height Monitoring System Project Team (NAT HMS PT)	07/12/2018	07/06/2019	Charlotte ROBB, NAT CMA	NAT SOG/20	Completed
NAT IMG/47 Dec 47/05	NAT SB ADS-B PT	NAT IMG	NAT POG	Reduced separation standards and flight efficiency through the implementation of SPACE Based/Low Earth Orbits (LEO) ADS-B	01/02/2016	01/12/2016	Iain BROWN, UK NATS	NAT IMG/53	Completed
NAT IMG/48 Dec 48/08	NAT SCRPT	NAT SPG	NAT IMG	NAT Southeast Corner Routes Project Team	01/05/2016	01/12/2016	Alastair Muir replaced by Martin Donnan, UK NATS	NAT IMG/53	Completed

	Reporting as of :			17 June 2019					
Created at	Project Team	Parent Group	Supervisor	Project Title	Start date	End date	Lead	Report	Progress Status
NAT IMG/50	OWAFS PT	NAT POG / NAT TIG		NAT Operations Without Assigned Fixed Speed (OWAFS)	03/27/2017	09/25/2017	Rich Stark (IATA) and Jim Webb (United States)	NAT IMG/53	Completed
NAT IMG/51 NAT SPG Con 54/3	ULT PT	NAT SPG	NAT IMG/NAT SOG	NAT Uplink Latency Timer Project Team	01/01/2018	15/12/2018	Bjarni Stefansson (NAT TIG Rapporteur)	NAT IMG/53	Completed
NAT SPG/53	NAT PBCS-I PT	NAT SPG	NAT IMG/NAT SOG	NAT Performance Based Communication and Surveillance Implementation Project Team (NAT PBCS-I PT)	24/07/2017	29/06/2018	Anthony Ferrante replaced by Kevin Haggerty, FAA US	NAT IMG/51 NAT SOG/17	Completed
NAT POG/03	NAT DOC007 PT	NAT POG		North Atlantic Operations and Airspace Manual (NAT Doc 007) Revision	27/03/2017	09/08/2017	Vince McMenamy, FAA US	NAT IMG/52 NAT SOG/18	Completed
NAT SOG 17/07	NAT SCMR PT	NAT SOG	NAT SOG	NAT Severity Classification Matrix Review (NAT SCMR PT)	01/01/2018	31/05/2018	Peter Friedrichs, NAVCanada	NATSOG/18	Completed
NAT SOG 17/04	NAT FDPEOCR PT	NAT SOG	NAT SOG	NAT Flight Deck Procedures and Ergonomics for Oceanic Clearances and Re-Clearances (NAT FDPEOCR PT)	01/01/2018	31/05/2018	Carolyn READ, NAT CMA Manager	NATSOG/18	Completed
NAT IMG/47 Dec 47/06	NAT FROI PT	NAT IMG	NAT POG	NAT Free Route Operations Implementation	01/02/2016	01/05/2016	Jeff Dawson, NAVCanada	NAT IMG/48	Completed
NAT IMG/47 Dec 47/10	NAT eANPV3 PT	NAT IMG	NAT POG	NAT eANP Volume III Project Team	01/01/2016	01/11/2016	Carole Stewart-Green, NAVCanada	NAT IMG/49	Completed
NAT IMG/47 Dec 47/16	RLastSM Ph2 TPT	NAT IMG	NAT POG	RLatSM Phase 2 Transition	12/11/2015	10/11/2016	Gavin Dixon, UK NATS	NAT IMG/49	Completed
NAT SPG/51 Con 51/07	PBCS PT	NAT SPG	NAT SOG/NAT IMG	Performance Based Communication and Surveillance Project Team	01/01/2016	31/12/2016	Tom Kraft, FAA	NAT IMG/49 NAT SOG/15	Completed
NAT IMG/48 Dec 48/17	SELCAL IPPT	NAT IMG	NAT POG	"Evaluation of need for mid-ocean SELCAL checks" trial implementation plan Project Team	01/05/2016	NAT IMG/50	Joe Ryan, Ireland & Kieran O'Carroll, IATA	NAT IMG/51	Completed
NAT IMG/47 Dec 47/13	AMLME PT	NAT IMG	NAT TIG	Aircraft message latency monitor evaluation	04/01/2016	NAT IMG/49	Jose Cabral(Portugal) and Patrick Tarrant(Ireland)	NAT IMG/51	Completed
NAT SPG 53/3	PBCS IS PT	NAT SPG	NAT IMG/NAT SOG	PBCS information sharing mechanisms	03/01/2017	NAT SPG/53	Karen Chiodini (USA)	NAT SPG/53	Completed

	Reporting as of :		17 June 2019						
Created at	**Project Team**	**Parent Group**	**Supervisor**	**Project Title**	**Start date**	**End date**	**Lead**	**Report**	**Progress Status**
NAT SOG 14/09	SPC PT	NAT SOG	NAT SOG/NAT IMG	NAT Safety Plan Components (SPC) (NAT SPC PT)	03/01/2017	NAT SOG/16	TBD	NAT SOG/16	Completed
NAT TIG 03	DLS PT	NAT TIG		NAT Data link Solutions	04/07/2017	NAT TIG/4	Tim Murphy (United Kingdom)	NAT IMG/51	Completed
NAT POG/03	NAT DB PT	NAT POG		NAT Datalink Bulletin Project Team (NAT DB TP)	03/27/2017	NAT POG/04	Iain Brown, UK NATS	NAT IMG/51	Completed

LIST OF ACRONYMS

ACM	Atlantic Coordination Meeting
ACP	Actual Communication Performance
ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance – Broadcast
ADS-C	Automatic Dependent Surveillance-Contract
AFI	(ICAO) Africa-Indian Ocean (Region)
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation And Control
Aireon ALERT	Aireon Aircraft Locating and Emergency Response Tracking
ANC	Air Navigation Commission
ANRF	Air Navigation Reporting Forms
ANSP	Air Navigation Service Provider
ASBU	Aviation System Block Upgrades
ASECNA	Agency for Aerial Navigation Safety in Africa and Madagascar
ASP	Actual Surveillance Performance
ASR	Annual Safety Report
ATC	Air Traffic Control
ATSU	Air Traffic Service Unit
BCA	Business Case Analysis
COM	Communications
CONOPS	Concept of Operations
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CPDLC	Controller Pilot Data Link Communications
CSP	Communications Service Provider
CTA	Control Area
DARP	Dynamic Airborne Reroute Procedures
DEMA	Deviations and Error Monitoring Application
DLM	Data Link Mandate
Doc 10004	*Global Aviation Safety Plan* (GASP)
Doc 10037	*Global Operational Data Link Document* (GOLD)
Doc 10118	*Global Aviation Security Plan* (GASeP)
Doc 4444	*Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM)
Doc 7030	*Regional Supplementary Procedures* (SUPPs)
Doc 9634	*Regional Air Navigation Plan – North Atlantic* (NAT eANP)
Doc 9750	*Global Air Navigation Plan* (GANP)
Doc 9988	*Guidance on the Development of States' Action Plans on CO_2 Emissions Reduction Activities*
EUR	(ICAO) European (Region)
EUR/NAT	European and North Atlantic
FANS	Future Air Navigation System
FIR	Flight Information Region
FL	Flight Level

GANP	*ICAO Global Air Navigation Plan* (Doc 9750)
GASeP	*ICAO Global Aviation Security Plan* (Doc 10118)
GASP	*ICAO Global Aviation Safety Plan* (Doc 10004)
GNSS	Global Navigation Satellite System
GOLD	*Global Operational Data Link Document* (Doc 10037)
HF	High Frequency
IAA	Irish Aviation Authority
IATA	International Air Transport Association
IFALDA	International Federation of Airline Dispatchers Associations
IFALPA	International Federation of Air Line Pilots' Associations
IFATCA	International Federation of Air Traffic Controllers' Association
LHD	Large Height Deviation
NAT	
NAT CMA	NAT Central Monitoring Agency
NAT DLMA	North Atlantic Data Link Monitoring Agency
NAT Doc	
NAT Doc 001	*North Atlantic Systems Planning Group Handbook*
NAT Doc 005	*Future ATM Concept of Operarations for the North Atlantic Region*
NAT Doc 006, Part I	*Air Traffic Management Operational Contingency Plan – North Atlantic Region*
NAT Doc 007	*North Atlantic Operations and Airspace Manual*
NAT Doc 010	*Consolidated Reporting Responsibilities Handbook – North Atlantic Region*
NAT EFFG	North Atlantic Economic, Financial and Forecast Group
NAT HLA	NAT High Level Airspace
NAT IMG	North Atlantic Implementation Management Group
NAT MWG	North Atlantic Mathematicians Working Group
NAT POG	North Atlantic Procedures and Operations Group
NAT Project Team	
NAT SCC PT	North Atlantic Safety Case Components Project Team
NAT ULT PT	NAT Uplink Latency Timer Project Team
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 eANP	*Regional Air Navigation Plan – North Atlantic* (Doc 9634)
NM	Nautical Mile
NOPAC	North Pacific
OCA	Oceanic Control Area
OPDLWG	ICAO Operational Data Link Specific Working Group
OTS	Organized Track System
OWAFS	Operations Without an Assigned Fixed Speed
PACOTS	Pacific Organized Track System
PANS	Procedures for Air Navigation Services
PANS-ATM	*Procedures for Air Navigation Services – Air Traffic Management* (Doc 4444)
PBCS	Performance-Based Communication and Surveillance
PBN	Performance-Based Navigation
PIRG	Planning and Implementation Regional Group
RASG	Regional Aviation Safety Group

RCC	Rescue Coordination Centres
RCP	Required Communication Performance
RLatSM	Reduced Lateral Separation Minimum
RLongSM	Reduced Longitudinal Separation Minimum
RMA	Regional Monitoring Agency
RSP	Required Surveillance Performance
RVSM	Reduced Vertical Separation Minimum
SAM	(ICAO) South American (Region)
SASP	ICAO Separation and Airspace Safety Panel
SAT	South Atlantic
SATVOICE	Satellite Voice Communications
SB ADS-B	Space-Based ADS-B
SKPI	Safety Key Performance Indicator
SLOP	Strategic Lateral Offset Procedures
SSGC	ICAO Secretariat Study Group on Cybersecurity
SSP	Satellite Service Provider
SUPPs	*Regional Supplementary Procedures* (Doc 7030)
TLS	Target Level of Safety
ToR	Terms of Reference
UTC	Universal Time Coordinated
VHF	Very High Frequency
VOLCEX	Volcanic Ash Exercises for the EUR Region
VOLKAM	Volcanic Ash Exercises for the (far) Eastern part of the EUR Region

— END —