INTERNATIONAL CIVIL AVIATION ORGANIZATION

SUMMARY OF DISCUSSIONS AND CONCLUSIONS OF

THE FORTY-FIFTH MEETING OF

THE NORTH ATLANTIC SYSTEMS PLANNING GROUP

Paris, 23 to 26 June 2009

PREPARED BY THE EUROPEAN AND NORTH ATLANTIC OFFICE OF ICAO JUNE 2009

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0. INTRODUCTION

Place and duration

0.1 The Forty-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 23 to 26 June 2009.

Officers and Secretariat

0.2 The Meeting was chaired by Mr Ásgeir Pálsson, the Representative of Iceland. Mr Karsten Theil, Regional Director, EUR/NAT Office of ICAO, was the Secretary of the Meeting and he was assisted by Mr Jacques Vanier, Mr George Firican, Mrs Carole Stewart-Green, Mr Elkhan Nahmadov and Mr Léon Vonlanthen from the same Office and Mr Walter Amaro and Mr Masoud Paydar from ICAO Headquarters. Additional assistance was provided by Mrs Nikki Goldschmid from the EUR/NAT Office of ICAO.

Attendance

0.3 In addition to the Representatives of the NAT SPG member States, representatives from the International Air Transport Association (IATA), the International Business Aviation Council (IBAC), the International Federation of Air Line Pilots Associations (IFALPA) and the International Federation of Air Traffic Controllers' Associations (IFATCA) attended the meeting. A list of participants is at **Appendix A**.

Activities of NAT SPG Groups

0.4 The NAT Mathematicians' Working Group (NAT MWG) had met in the EUR/NAT Office of ICAO from 27 April to 1 May 2009 to consider the mathematical and statistical aspects of the safety of separation minima applied in the NAT Region. The Representative from the United States presented the NAT MWG report in support of the assessment of system safety performance in terms of lateral and vertical risk.

0.5 The NAT Safety Management Co-Ordination Group (NAT SMCG) had met in Edinburgh, Scotland from 17 to 21 November 2008 and at the EUR/NAT Office of ICAO from 21 to 24 April 2009 to review reported oceanic navigational occurrences from April 2008 to March 2009. The Rapporteur, Mr David Nicholas from the NAT Central Monitoring Agency (CMA), United Kingdom, provided the NAT SPG with the group's report.

0.6 The NAT Aeronautical Communications Group (NAT ACG) held its ninth meeting at the EUR/NAT Office of ICAO, France, from 6 to 8 May 2009. The Rapporteur, Mr Jose Cabral from Portugal, presented their report.

0.7 The NAT Operations Managers (NAT OPS MNG) met in Reyjavik, Iceland from 16 to 18 September 2008 and their report was presented by the Secretariat.

0.8 The NAT Traffic Forecasting Group (NAT TFG) had not met since NAT SPG/44, but the discussion concerning their work is reported at paragraph 2.1.

0.9 The NAT Implementation Management Group (NAT IMG) had met twice since NAT SPG/44 and its Chairman presented the report on NAT IMG activities.

0.10 The NAT Economic and Financial Group (NAT EFG) had met twice since NAT SPG/44 and a report on their activities and findings was presented by the Secretariat.

0.11 The NAT SPG expressed its appreciation to all those who had worked within the above mentioned groups and associated task forces for the quality of the material that they had produced.

Agenda

0.12 The Group agreed to the following agenda for organising the work of the Meeting and the structure of the report:

Agenda Item 1: Developments

1.1 ICAO Panels and Committees
1.2 Adjacent Regions
1.3 Structure and working methods of the NAT SPG

Agenda Item 2: Planning and implementation

2.1 NAT TFG (shorter report to NAT SPG)
2.2 NAT IMG
2.3 NAT EFG
2.4 Data link implementation matters
2.5 Other issues

Agenda Item 3: Air navigation system review

3.1 Safety Management
- a) NAT SMCG report
- b) NAT MWG report
- c) Other safety related matters

3.2 Operational issues
- a) NAT ACG
- b) Other issues

Agenda Item 4: Support services

4.1 NAT DMO
4.2 NAT SPG Handbook

Agenda Item 5: Any other business

5.1 NAT SPG follow-up
5.2 Next meeting

1. DEVELOPMENTS

1.1 ICAO PANELS AND COMMITTEES

1.1.1 It was reported that the Air Navigation Commission (ANC) had reviewed the report of the first meeting of the Working Group of the Whole of the Aeronautical Surveillance Panel (ASP WGW/1) that had been held in December 2008. The aforementioned report contained, inter alia, the following proposals:

a) amendments to Annex 10, Volumes III and IV relating to SSR and Automatic Dependent Surveillance-Broadcast (ADS-B) using 1 090 Mega Hertz (MHz) extended squitter;

b) amendments to Airborne Collision Avoidance Systems (ACAS) Standards and Recommended Practices (SARPs) including a proposed upgrade to the collision avoidance logic with a suggested implementation date of 1 January 2012 for new installations; and

c) new draft SARPs for multilateration systems (for air traffic surveillance) and airborne surveillance applications (for the use of ADS-B in messages in the flight deck) containing system-level and functional requirements.

1.1.2 The ANC conducted a preliminary review of the aforementioned proposals and agreed that they be sent to States and international organizations for consultation. Moreover, the meeting noted that with regards to b) above, States and international organizations would be requested to provide information on the extent of the effort required to upgrade existing ACAS units and propose an appropriate date for retrofit.

1.2 ADJACENT REGIONS

ICAO Developments - Adjacent Regions

1.2.1 The ICAO Secretariat informed the Group on the development regarding the advancement of the Single Sky implementation in Europe. In this regards, it was reported that several States in the Western part of the EUR Region (Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland) had agreed to implement the Central European Functional Airspace Block (FABEC). The States concerned had signed a declaration of intent and were preparing a Treaty which would allow an initial implementation step to be taken at the end of 2010. Furthermore, the implementation of a Functional Airspace Blocks (FAB) in the Iberian Peninsula (Portugal and Spain) was also ongoing. As regards the United Kingdom-Ireland FAB, NATS and the Irish Aviation Authority (IAA), the United Kingdom and Irish Air Navigation Service Providers (ANSP) have published their three-year plan for making the management of the airspace for which they are responsible more efficient, and to provide enhanced safety and environmental benefits.

1.2.2 The Group noted that Canada had implemented ADS-B in the Hudson Bay area of Northern Canada on 15 January 2009(a mixed ADS-B/non ADS-B service was being provided for the time being). Although the initial number of operators and aircraft was limited, the number was increasing and the operators were able to avail themselves of the improved flight efficiency.

1.2.3 The Group was informed regarding efforts undertaken within the Secretariat to improve inter-regional coordination. To this effect, a meeting of ICAO representatives from the Asia/Pacific (APAC), EUR, Middle East (MID) and Western and Central African (WACAF) Regional Offices was held in Cairo in March 2009. It was planned that such meetings with other ICAO Regions would also be held to discuss issues of mutual concern.

1.2.4 In follow up to NAT SPG Conclusion 44/3 – Establishment of the Surveillance and Communications in Northern Airspace Task Force (SCNATF), the Group noted that Canada had carried out the task and as a result, the contents of the Arctic Flight Information Regions (FIR) Air Traffic

Management/Communications, Navigation and Surveillance (ATM/CNS) table was updated thus fulfilling the requirements of the NAT SPG Conclusion.

1.2.5 It was also noted that the Cross Polar Working Group (CPWG) would be maintaining the accuracy of the contents of the table and advance further work in order to respond to the Trans-Regional Airspace and Supporting ATM Systems Steering Group (TRASAS) Conclusion 2/3 regarding the Improved Surveillance and Communications in the Northern Airspace. The NAT IMG had agreed that the SCNATF had completed its assignment and should be disbanded and that the TRASAS should be informed accordingly.

Amendments to procedures for Air Navigation Services – Air Traffic Management (PANS-ATM)

1.2.6 The Group was informed that the President of the Council approved on 24 April 2009 Amendment No. 2 to the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM) (Doc 4444). The Amendment incorporated changes to the Special Procedures for in-flight contingencies in Oceanic airspace that were fully in line with the material developed for the NAT Region. Also of significance to the NAT Region, the provisions related to Strategic Lateral Offset Procedures (SLOP) had been moved from Chapter 15 – Procedures related to Emergencies, Communications Failure and Contingencies to Chapter 16 – Miscellaneous Procedures. Through this Amendment, which would be effective on 19 November 2009, the task of developing revised contingency procedures had been completed.

1.2.7 The Group noted that the implementation of Amendment 1 to the PANS-ATM (Doc 4444), which had been approved by the President of the Council on 27 May 2008 could require significant efforts by some States as the contents and meanings of Items 10 and 18 of the ICAO Filed Flight Plan (FPL) would change significantly. Because of the global nature of the flight plan and the fact that it was subject to many checks before entering automation systems, the importance of planning for a smooth transition from the existing flight plan to the modified one must be recognised.

1.2.8 When examining the transition guidelines published by ICAO (State Letter AN/2.1-09/9 of 6 February 2009), the Group was informed that the NAT IMG felt that a phased implementation could prove to be problematic and it therefore supported a "synchronised big bang" approach to implementation. The NAT IMG had also agreed that a mechanism should be put in place to ensure continuity of services and a smooth transition.

1.2.9 The Group noted that the Secretariat as well as the United States Federal Aviation Administration (FAA) was coordinating this matter with EUROCONTROL in order to ensure consistency between the EUR, North America (NAM) and NAT Regions. The Secretariat would also oversee the necessary coordination between the NAT SPG, the European Air Navigation Planning Group (EANPG) and EUROCONTROL. In this respect, the Secretariat advised that EANPG had tasked EUROCONTROL, on behalf of the ICAO EUR/NAT Office, to develop a "*FPL 2012 Implementation Plan*" to cover the whole area of accreditation of the EUR/NAT Office. Iceland agreed to be included in this plan.

ANC review on the report of the NAT SPG/44

1.2.10 The Secretariat presented the Group with a working paper regarding the action taken by the ANC on the NAT SPG/44 Report. The Group recalled that following each Planning and Implementation Regional Group (PIRG) meeting, the report is first reviewed by a working group of the ANC followed by the ANC itself and finally by the Council (only if specific items would require action from the Council). During these reviews, the ANC and the Council note the report, make comments thereon and provide guidance to the PIRG as appropriate. Furthermore, the ANC and the Council may take specific action on certain conclusions contained therein, since the follow-up to some conclusions may require approval by the ANC or the Council. Follow-up actions by the ICAO Secretariat on conclusions and decisions of PIRG are then guided by the outcome of the ANC and the Council actions described above.

1.2.11 In this respect, the ANC when reviewing the NAT SPG/44 Report took specific action on certain conclusions that would require follow-up actions in the work programme of NAT SPG, as follows:

- *Application of 5 minute climb/descent between Global Navigation Satellite Systems (GNSS) equipped aircraft*. The ANC noted that efforts for implementation of a 5-minute separation minimum between GNSS aircraft in the climb or descent by 15 January 2009 (Conclusion 44/4 refers), was not ideally synchronized with the efforts of the Separation and Airspace Safety Panel (SASP) to incorporate the minimum in the PANS-ATM (Doc 4444). The Secretariat advised the ANC that SASP had, for the most part, completed the development of the proposal and that the preliminary review would be presented to the Commission during the 180th Session. It was noted that no difficulties in developing the proposal had been experienced, due largely to the fact that the procedure and minimum were derivatives of a long-existing longitudinal separation minimum that applied to exact reporting points (ground-based navigation aids). In this light, the ANC supported the on-going implementation efforts, acknowledging that a preliminary operational trial amongst operators that agreed to support the collection of data and further the PANS-ATM (Doc 4444) amendment would be of benefit to all oceanic regions which would wish to apply the reduced minimum (paragraph 2.2.12 also refers).
- *5-minutes longitudinal separation between ADS-Contract (ADS-C) pairs*. On this subject the ANC noted that this separation was not in the PANS-ATM (Doc 4444) and SASP had not been tasked to progress the minimum. While the importance of a number of key enablers was referred to in the report, including navigation, communication and surveillance capabilities, only Required Communications Performance (RCP) 240, to be used as a basis, was mentioned. In the knowledge that the separation would halve the existing separation currently in the PANS-ATM (Doc 4444), the ANC agreed to amend SASP's work programme to monitor the efforts of NAT SPG to advance this procedure, review the modeling work undertaken and develop an amendment to the PANS-ATM (Doc 4444) prior to implementation. Further, the ANC also directed Operational Data Link Panel (OPLINKP) as part of its work programme to provide assistance in terms of RCP implementation (paragraph 2.2.18 also refers).
- Data Link Harmonization Strategy: With the exception of an editing matter concerning the use of the term "utilize", which was left to the Secretariat to consider further, the ANC agreed that the strategy should be circulated to States and international organizations.

1.2.12 *Development of a Required Communication Performance (RCP) implementation plan* for the NAT Region: In reference to Conclusion 44/11 concerning a desire to develop a project management plan for the implementation of RCP in the NAT Region, the ANC was informed that there had been close coordination between the Secretariat in Montréal, the EUR/NAT Office and the APAC Office to ensure regional interoperability and that RCP would be advanced in a global manner. While this was accepted as an important aspect of the early implementation of RCP, the ANC noted that there was no clear relationship between the date of the proposed mandating of RCP in the NAT (last quarter of 2015) and a specified, operational need in that time frame. An RCP type would normally apply directly to a specific Air Traffic Services (ATS) function, such as a reduced separation minimum, where a defined communication performance was a necessary requirement for the application of the minimum or procedure. It was noted, as an example, that RCP might need to be applied to a reduced 5-minutes longitudinal separation between ADS-C pairs. Consequently, there needed to be a correlation between a function, and the time frame for its implementation where equipage would be mandated. It would be essential, therefore, that priority be given to updating the NAT Service Development Roadmap as quickly as possible, to clearly state the planning activities the NAT Region intended to embark upon and provide an indication to airspace users what to expect and when (paragraphs 2.2.31 and 2.2.32 also refer).

1.2.13 *Use of satellite communication (SATCOM) voice for routine air traffic services (ATS)*: The Commission noted the proposal of NAT SPG in Conclusion 44/13 to develop an implementation plan for migrating to the use of SATCOM voice for routine communication that could be adapted for global use. It was further observed by the ANC that this migration was to be viewed as an upgrade to the SATCOM voice

service (currently limited to emergency and non-routine communications), and not as a technology alternative to ADS-C and Controller Pilot Data Link Communications (CPDLC). These data link capabilities would continue to remain high priority in the future planning of surveillance and communication services in the NAT Region. Particularly for those aircraft that did not have data link capability, the ability to use SATCOM voice instead of high frequency (HF) communications could be viewed as a major milestone in the move to satellite-based communication in oceanic airspace. It was noted by the ANC that there were no specific SATCOM voice implementation issues that had been raised with the Secretariat requiring the development of SARPs. It was further recalled, however, that any remaining issues of concern would be included in the implementation plan, and also, the development of guidance material, as well as implementation guidelines, to further the use of satellite voice communications, were on the work programme of OPLINKP.

1.2.14 The Group noted the action taken by the ANC on the NAT SPG/44 Report and agreed to include the follow-up actions in the work programme of the NAT SPG.

1.3 STRUCTURE AND WORKING METHODS OF THE NAT SPG

Outcome of the NAT SPG Symposium

1.3.1 The Group was informed about the outcome of the NAT SPG Symposium on Structure and Working Methods that had been convened in the EUR/NAT Office of ICAO in Paris from 3 to 5 November 2008 to complete action on NAT SPG Conclusion 44/41. The Symposium had been attended by all NAT SPG member States, but the absence of IATA had been regretted.

1.3.2 The Symposium had noted that the role of Regional Air Navigation (RAN) meetings to develop and agree on regional requirements had increasingly been transferred to the PIRG. For that reason, the NAT SPG had considered it important that, when setting regional requirements, due consideration be given to global requirements and to seamless operations and interoperability as stipulated by the *Global Air Traffic Management (ATM) Operational Concept* (Doc 9854), which had been endorsed by the 11th Air Navigation Conference (AN-Conf/11 – Montréal, 22 September to 3 October 2003).

1.3.3 AN-Conf/11 had recommended that ICAO, as a high priority, develop a set of ATM functional and operating requirements for a global ATM system on the basis of the Global ATM Operational Concept, which would take full account of the need to move to a performance based system. The Symposium had noted that the Global ATM Operational Concept, when translated to fit into the NAT environment, suggested a set of NAT regional performance requirements with regard to Safety, Regularity, Efficiency, Communications, Navigation and Surveillance. The Symposium had agreed that those performance requirements should be included in the working structure of the NAT SPG.

1.3.4 The Symposium had acknowledged the importance of the involvement of the regulatory/supervisory entities of the NAT Region provider States in setting the performance requirements as they were responsible for the approval/certification/licensing of the ANSPs and the aircraft operators against those requirements. The involvement of the users' organisations was equally important to ensure that the overall system performance would meet expectations.

1.3.5 The Symposium had also acknowledged the necessity to include "environment" in the regional performance requirements and to keep environment differentiated within efficiency, and in particular differentiated from flight efficiency as seen from a user's or from a provider's point of view.

1.3.6 The Symposium had recalled that the 36th Session of the ICAO Assembly had adopted Resolution A36-7 which called upon States, and invited other stakeholders, to cooperate in the development and implementation of regional, sub-regional and national plans based on the framework of the global plans. The objective of the *Global Aviation Safety Plan* (GASP) was to reduce the risk of accidents for civil

aviation by providing a common frame of reference for all stakeholders in order to allow a more proactive approach to aviation safety and to help coordinate and guide safety policies and initiatives worldwide. The Symposium had proposed that the NAT SPG should now orient its safety policies and planning and implementation mechanisms to ensure alignment with the GASP.

North Atlantic Region Safety Policy

1.3.7 NAT SPG Conclusion 44/41 had directed the Symposium to develop a recommendation for a NAT Region Safety Policy. In doing so, the Symposium had agreed that it would be appropriate to consider the role and responsibilities of the regulators, the ANSPs and the NAT SPG itself, including all its contributory bodies. It had also considered that a common NAT SPG safety policy should be endorsed by both the regulators and the service providers concerned. With this in mind, the Group agreed with the high level Safety Policy developed by the Symposium which is at **Appendix B**. As regards the promulgation of this information, the Group agreed that the Policy Statement should be published in the NAT SPG Handbook and that the Regional Director EUR/NAT Office of ICAO should be requested to circulate it in a State Letter.

NAT SPG Conclusion 45/1 – North Atlantic Region Safety Policy

That the:

a) NAT Region provider States and user organisations endorse the North Atlantic Region Safety Policy as shown in **Appendix B** to this report; and

b) ICAO Regional Director, Europe and North Atlantic, on behalf of the NAT SPG:

   i) circulate in a State Letter the North Atlantic Region Safety Policy to NAT Region provider and user States and to user organisations; and

   ii) publish the North Atlantic Region Safety Policy in the NAT SPG Handbook.

NAT SPG Working Structure

1.3.8 The Symposium, when reviewing the Global Air Navigation Plan (Global ANP), had recalled that the 184th Session of the Council of ICAO had decided on the composition of PIRGs as well as their terms of reference. As regards the NAT SPG, the terms of reference remained unchanged. The Symposium also recalled that the main activities of the NAT SPG were divided into two main areas, namely monitoring the safety of the system and taking action when required and overseeing planning and implementation activities.

1.3.9 The Group agreed that although there was no need to propose any changes to the existing terms of reference, modification of the work breakdown as indicated in paragraph 1.3.8 was needed. It was agreed to make adjustments to the working structure and to the terms of reference of the contributory bodies to accommodate the change in emphasis to performance based requirements, as driven by the Global ANP, and to take account of the GASP. With that objective and bearing in mind the Council directives and guidelines, the Group agreed on a requirements-driven approach. In doing so, it had also been agreed that performance based requirements could originate from any stakeholder, and the NAT SPG would then assign tasks to one or more of its contributory bodies.

1.3.10 The work of the NAT SPG would be centred on three main areas: safety oversight, planning and implementation, and financial considerations. Therefore, the Group agreed to the working structure of the NAT SPG as shown in the organisation chart in **Appendix C**. It was highlighted that planning and implementation activities were closely linked to safety oversight and to financial considerations (business cases).

1.3.11 As regards the work of the NAT Operations Managers, the Group noted the value that derived from the bilateral and multilateral arrangements used to address day to day operational issues between the ATS units concerned. It was agreed that these types of arrangements were best left to the operational level but that issues requiring support within the NAT IMG work programme should be addressed within its framework. Accordingly, the Group agreed to disband the NAT OPS MNG, as a formal part of the NAT SPG working structure, with the understanding that the actual day to day inter-unit coordination would continue and that any required coordination with the NAT IMG working structure would take place directly between the ATS units and the NAT IMG.

1.3.12 Concerning the NAT ACG, the Group agreed that its working arrangements should be similar to what was agreed for the NAT OPS MNG. Operational coordination should take place at the ATS unit level but planning activities should be managed from within the NAT IMG framework. Accordingly, it was agreed that the NAT ACG be disbanded as a formal NAT SPG group and that its tasks and work programme be transferred to a NAT CNS Group (NAT CNSG), established as a contributory body to the NAT IMG as shown in the organisation chart in **Appendix C**.

1.3.13 As regards the establishment of a NAT Safety Oversight Group (NAT SOG) the Group agreed that the NAT Safety Management Coordination Group (NAT SMCG) should be subsumed by the NAT SOG with the contributory bodies as shown in the organisation chart in **Appendix C**.

1.3.14 The Group agreed that no changes were required to the NAT EFG for the time being.

NAT SPG Conclusion 45/2 – NAT SPG Working Structure and Methodology

That:

a) the working structure of the NAT SPG be as shown in the organisation chart in **Appendix C** to this report;

b) the NAT Operations Managers Group be disbanded, as a formal part of the NAT SPG working structure, and that any required coordination with the NAT Implementation Management Group (NAT IMG) working structure should take place directly between the Air Traffic Services Units and the NAT IMG;

c) the NAT Aeronautical Communications Group (NAT ACG) be disbanded as a formal NAT SPG group and that its tasks and work programme be transferred to the NAT IMG; and

d) a NAT Safety Oversight Group (NAT SOG) be established, subsuming the NAT Safety Management Coordination Group with contributory bodies as shown in the organisation chart in **Appendix C** to this report.

1.3.15 With regards to the groups whose work had been subsumed into the NAT IMG working structure, the Chairman thanked the Rapporteurs of the groups concerned for the professional inputs into the work of the NAT SPG over the years.

Terms of reference for the NAT IMG and its working structure

1.3.16 The Group was informed that the NAT IMG had reviewed the outcome of the Symposium on Structure and Working Methods (paragraphs 1.6.1 to 1.6.12 refer). In doing so, it had completed a review of the terms of reference, working methods and rapporteurship of its contributory bodies taking account of the Symposium's consensus that no major changes to the basic working structure of the NAT IMG itself were required.

1.3.17 The Group examined a proposal to update the NAT IMG terms of reference to take account of the decision to move to a performance based system that took account of the GASP in the overall work of

the NAT IMG and its working structure. The Group endorsed the revised NAT IMG terms of reference as shown in **Appendix D** and noted the terms of reference of its contributory bodies as shown in **Appendix E**.

1.3.18 As regards the status of the NAT Future Air Navigation Systems (FANS) Central Monitoring Agency (NAT FCMA), the Group noted that its role would be expanded to include all aspects of data link applications. Therefore its terms of reference were developed with that requirement in mind. Also, the NAT FCMA was re-named the NAT Data Link Monitoring Agency (NAT DLMA). Details regarding the establishment and working arrangements of the NAT DLMA are at paragraphs 2.4.11 through 2.4.17.

1.3.19 The Group discussed a proposal to clarify the roles and expectations regarding Chairmen and Rapporteurs and agreed on the following definitions for those terms:

- **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 EFG operate with a Chairman.

1.3.20 The Group, in agreeing upon the definitions, also agreed that the NAT SPG, the NAT EFG, the NAT IMG and the NAT SOG would be led by Chairmen and that the contributory groups to the NAT IMG and the NAT SOG should be led by Rapporteurs. Finally, the Group agreed that the definitions of these terms should be included in the NAT SPG Handbook.

NAT SPG Conclusion 45/3 – Definitions of Chairman and Rapporteur

That:

a) the definitions of the terms "Chairman" and "Rapporteur" as presented in paragraph 1.3.19 of this report be applicable to the NAT SPG and its working structure;

b) the NAT SPG, NAT Economic and Financial Group, NAT Implementation Management Group (NAT IMG) and the NAT Safety Oversight Group (NAT SOG) be led by Chairmen;

c) the contributory groups of the NAT IMG and NAT SOG be led by Rapporteurs; and

d) all of the above be documented in the NAT SPG Handbook.

1.3.21 The Group was informed that the NAT IMG had reviewed its procedure for the appointment of the Rapporteurs of its working groups. It had been recognised that, although the procedure had worked well in the past, there was merit in clearly documenting the process. Accordingly, it was agreed that the Rapporteurs of the NAT IMG contributory groups would be appointed from amongst the NAT SPG member States by the NAT IMG and that appointments would be subject to biennial review. The Group also agreed with the NAT IMG proposal that the NAT SPG should address the issue of the Chairmanship for all its subsidiary groups. As such, it was agreed that the appointment of the Chairman of the NAT IMG be subject to a biennial review. The Group then agreed that the current NAT IMG Chairman should remain and that the chairmanship would be reviewed in 2011. The Group noted that although the NAT IMG would regularly review the rapporteurship of its contributory groups, this would not necessarily result in changes in rapporteurship because of the need to maintain, to the extent possible, continuity in addressing work

programmes. With this in mind, efforts would also be made to avoid changes in rapporteurship for multiple groups during the same year.

1.3.22 The Group agreed with the proposal that the NAT IMG be composed of members from all of the NAT SPG member States supplemented by the participation of representatives from IACA, IATA and IBAC. As regards the composition of the NAT IMG contributory groups, it was noted that the membership would be drawn from the NAT SPG member States supplemented by selected user States and international organizations. In addition, taking account of the level of technical expertise required by certain groups to carry out their work programmes, the contributory groups could also invite participants from other States, organizations or industry as required (paragraphs 3.1.13 et 3.1.14 also refer).

1.3.23 The Group was informed that the NAT IMG had stressed the importance of maintaining an informal co-ordination structure between its working groups and the safety oversight function. For example, it should not be necessary to wait for formal direction from the NAT IMG in all circumstances before responding to safety related matters; instead action should be taken by the working groups and the NAT IMG would be informed accordingly. The Group supported the proposal and agreed that the NAT IMG should take the necessary measures to put in place a coordination mechanism between the NAT IMG and the NAT SOG.

1.3.24 The Group was informed that the NAT IMG had examined its working methods to find ways and means to reduce costs and time, to improve the work flow and to maintain the planning time frames imposed by the NAT Services Development Roadmap. The Group supported the NAT IMG proposal that working groups should meet face-to-face as required by the work assignment and that their meeting schedule would be approved by the NAT IMG. Furthermore, the working groups would make every reasonable effort to use other means such as teleconference and electronic correspondence to reduce the frequency of face-to-face meetings. Work would be carried out as required using such other means between face-to-face meetings in order to expeditiously carry out the business.

1.3.25 The Group noted that the NAT IMG would approve the terms of reference of its working groups by correspondence by 31 July 2009 and that the new structure would become effective at that date. The Group agreed that, as soon as the NAT IMG had approved the terms of reference, the NAT SPG Handbook would be amended to incorporate the changes as shown in **Appendix D** and **Appendix E**.

NAT SPG Conclusion 45/4 - Revised terms of reference for the NAT Implementation Management Group (NAT IMG)

That the:

a) terms of reference of the NAT IMG be modified as shown in **Appendix E** to this report:

b) NAT IMG working structure include ways and means for direct coordination with the NAT Safety Oversight Group (NAT SOG); and

c) Chairmanship of the NAT IMG be reviewed on a biennial basis.

Terms of Reference of the NAT SOG and its contributory bodies

1.3.26 The Group then addressed the actions which would be necessary to implement the safety management structure proposed by the Symposium. The Group agreed upon terms of reference for a NAT Safety Oversight Group, as detailed in **Appendix F** and appointed Captain Ken Gillespie from the United Kingdom as its first Chairman. The Group noted that the first meeting of the NAT SOG would take place at the EUR/NAT Office of ICAO in Paris, from 21 to 24 September 2009.

1.3.27 In preparing the initial terms of reference for the NAT SOG contributory groups, the Group took account of the close working relationship that would be needed between the NAT SOG, NAT Scrutiny Group (NAT SG) and the NAT MWG and the requirement that there be no impediment to the timely exchange of information regarding safety management matters between all contributory groups of the NAT SPG. In taking account of this latter point, the revised terms of reference for the NAT IMG working structure included a requirement that all reports of NAT IMG contributory groups should clearly identify safety management related issues (paragraphs 1.3.17 and **Appendix F** refer). The Group agreed that the intent of this was to facilitate and ensure the exchange of safety information and agreed this intent would be included in the NAT SPG Handbook.

NAT SPG Conclusion 45/5 – Exchange of safety management related information

That, recognising the importance of all NAT SPG contributory groups being aware of safety management issues in the NAT Region and thereby maximising contributions to the resolution of these issues and to facilitate the exchange of safety management information, each meeting of every NAT SPG contributory group shall:

a) review the safety management sections of the most recent reports of all other NAT SPG contributory groups; and

b) document any relevant comments in the safety management section of their own report.

1.3.28 After reviewing detailed input from the NAT SMCG and the NAT MWG the Group agreed to establish a NAT SG to carry out a scrutiny function with the terms of reference detailed in **Appendix G**, noting the requirement that the work of the NAT SG required the participation of at least one representative of the NAT MWG to contribute to the task of properly categorising occurrences for the purposes of mathematical analysis (paragraph 3.1.31 also refers). The Group agreed that the NAT SMCG be disbanded and that the NAT MWG would become a contributory group to the NAT SOG. Finally, the Group amended the terms of reference for the NAT CMA and the NAT MWG, as detailed in **Appendix H**. In so doing, the Group recognised that the NAT SOG itself would, in future, review and update as necessary the terms of reference and manage the work programmes of its contributory groups.

NAT SPG Conclusion 45/6 – Establishment of a revised NAT SPG safety management structure

That:

a) a NAT Safety Oversight Group and a NAT Scrutiny Group be created with the terms of reference presented in **Appendix F** and **Appendix G** to this report;

b) the NAT Safety Management Coordination Group be disbanded;

c) the terms of reference of the NAT Central Monitoring Agency and the NAT Mathematicians' Working Group be updated in accordance with the changes presented in **Appendix H** to this report; and

d) the NAT SPG Handbook be updated accordingly.

1.3.29 The Group expressed its sincere thanks to the NAT SMCG, and Mr David Nicholas the Rapporteur, for the quality of its work over the years, which had significantly contributed to the NAT SPG's awareness of safety management issues and facilitated its addressing of safety concerns. Indeed, the work of the NAT SMCG had set the groundwork for the evolution of the NAT SPG's safety management activities and structure.

2. PLANNING AND IMPLEMENTATION

2.1 NORTH ATLANTIC TRAFFIC FORECASTING GROUP

2.1.1 The Group recalled the NAT TFG had been meeting biennially since 1994 to update the NAT forecasts. However, it had been an accepted policy that the NAT TFG biennial meetings be supplemented by interim meetings, when needed.

2.1.2 It was also recalled that the NAT TFG would monitor actual 2008 passenger and flight data throughout the year and make a decision early in 2009 as to whether an interim meeting would be needed to adjust their short and/or long-term assumptions and forecasts. If needed, an interim meeting would be held in Washington, DC in the spring of 2009. This proposal had been supported by NAT SPG/44 considering the sharp increase in the price of fuel coupled with the anticipated restructuring of the demand for the system eventuated by the Open Skies Agreement. However, in the meantime, the global economic situation had changed dramatically with a significant knock-on effect on international civil aviation. As a result, significant uncertainty had arisen which the NAT TFG felt would counteract any work carried out to update the forecasts. It was noted that the NAT TFG would hold its next regular meeting in the spring of 2010 (paragraph 2.3.4 also refers).

NAT SPG Conclusion 45/7 – Coordination with the NAT Traffic Forecasting Group

That the ICAO Regional Director, Europe and North Atlantic:

a) consult with the NAT Traffic Forecasting Group (NAT TFG) members to determine:

   i) whether the NAT TFG can make use of other available forecasting data to minimise the amount of work necessary to complete the NAT traffic forecasts; and

   ii) if, taking account of i) above, it is possible to convene meetings of the NAT TFG annually rather than every two years; and

b) inform the NAT SPG.

2.1.3 In considering the above, the Group noted that the NAT TFG might have the expertise to provide guidance regarding how to account for unanticipated volatility when using the traffic forecasts, and agreed that the NAT TFG work programme should be modified accordingly.

NAT SPG Conclusion 45/8 – Updates to NAT Traffic Forecasts

That, in addition to the tasks endorsed by the NAT SPG at its 44th meeting, the NAT Traffic Forecasting Group indicate if possible, appropriate methods to take account of the current volatility of the aviation sector when using forecast information.

2.2 NORTH ATLANTIC IMPLEMENTATION MANAGEMENT GROUP

NAT operational contingency plan

2.2.1 The Group noted that, in follow up to NAT SPG Conclusion 43/26, the NAT IMG had completed the task of developing a NAT Region contingency plan; it would now be updated as required. The document would be posted on the ICAO EUR/NAT web site under Documents/NAT Docs as well as on the NAT Programme Coordination Office (PCO) website and would be available for download from either of the following Uniform Resource Locators (URL) :

a) ICAO EUR/NAT: http://www.paris.icao.int/documents_open/subcategory.php?id=106

b) NAT PCO: http://www.nat-pco.org/

NAT PCO Migration; Document Access for NAT SPG Meetings

2.2.2 The Group was advised that the transfer of the NAT PCO web site, which had begun in July 2007, from the United Kingdom host to the ICAO EUR/NAT host, had been completed. The members' extranet site had been discontinued and a new File Transfer Protocol (FTP) server (with the URL: ftpaccess.paris.icao.int) had been implemented to ensure the distribution of the meeting documents. However, the use of the FTP protocol was creating access problems for many users of the site. Accordingly, it was agreed that future access to the documents be ensured via hypertext transfer protocol (HTTP), using the ICAO EUR/NAT site as a portal.

Required Communications Performance (RCP)

2.2.3 In follow-up to NAT SPG Conclusion 44/11, the NAT IMG had initiated work on developing a RCP implementation plan. Considering the uncertainty as to whether it would be possible for the Communications Service Providers (CSP) to achieve RCP 240, an alternative plan was being proposed which used as a basis the direction provided by NAT SPG/44 regarding RCP 240 (Summary of Discussions and Conclusions of the 44th Meeting of the NAT SPG, paragraph 2.1.32 refers).

2.2.4 The RCP implementation plan would be considered in relation to ATS functions and planned operational improvements. The plan would initially address three service improvement programmes: the implementation of the reduced longitudinal separation, the implementation of the 25 NM lateral separation and the use of SATCOM voice as a long range communications system. Initial efforts would be directed at drafting an RCP implementation plan to support reduced longitudinal separation. The plan would identify any mitigation required if it was determined that RCP 240 (as defined in the Guidance Material for ATS Data Link Services in North Atlantic Airspace) could not be met in time to carry out trials to validate the implementation of reduced longitudinal separation using ADS-C. The other two initiatives would be addressed at a later time. The Group noted that the NAT IMG would continue to provide updates and that Conclusion 44/11 remained extant.

Performance based navigation (PBN)

2.2.5 The Group recalled that, as part of the follow up action to the 36th Assembly of ICAO (September 2007) Assembly Resolution A36-23, it had tasked the NAT IMG with carrying out studies to develop a PBN transition plan. In doing so, it was recalled that it had favoured the use an existing navigation specification rather than developing a new one. This was a critical milestone that needed to be achieved before a PBN transition plan could be finalised.

2.2.6 The Group was informed that RNP 4 might well be a suitable candidate to serve as the navigation means to support 25 NM lateral separation and therefore be used in the PBN transition plan. However, it would be necessary to characterise the airspace and find ways to control the atypical errors. It was recalled that atypical errors might cause the risk to exceed the Target Level of Safety (TLS); however the CNS elements contained within the FANS 1/A equipment might provide the potential for mitigation.

2.2.7 In addition, as the result of studies and various consultations, it had been confirmed that GNSS was currently a *de-facto* requirement for RNP 4 in oceanic or remote areas. Therefore, the navigation performance exhibited by GNSS equipped aircraft could be used to determine the 95% containment of aircraft approved to the RNP 4 specification. The navigation performance exhibited by GNSS equipped aircraft should be adequate to sustain 25 NM lateral separation and should also be sufficient to take account of the application of SLOP. This would also need to be verified.

2.2.8 The Group was informed that the NAT IMG would evaluate the information to determine whether RNP 4 would be sufficient to meet the planning requirements of the NAT Region in terms of

navigation performance. The outcome of the evaluation would then be used to develop a recommendation on the way forward for NAT SPG/46.

2.2.9 Another aspect to be considered when developing a PBN transition plan was the transition from Minimum Navigation Performance Specifications (MNPS) to RNP. It was recalled that it may not be worthwhile moving from MNPS to RNP 10 and thence to a lower RNP value (RNP 4) because the cost of a two-step approach outweighed the benefits. Another consideration was that MNPS approved encompassed more than the core navigation performance as it included considerations that related directly to airspace safety. It was however recognised that it would be necessary to transition to RNP(x) at some date; two candidates were being considered (RNP 10 and RNP 4), provided the requirements of reduced lateral separation could be met.

2.2.10 As regards RNP 10, there were costs associated with the transition as some aircraft would need to be re-approved and not all RNP 10 certified aircraft would necessarily be approved to operate in NAT MNPS airspace. Furthermore, flight planning and dispatch considerations would also have to be taken into account. On the other hand, no benefits could be identified that the transition to RNP 10 would provide to operators.

2.2.11 The Group noted that the NAT IMG had supported the proposal to move directly from MNPS to RNP 4 provided the identified issues could be resolved satisfactorily. Nevertheless, it would be necessary to further examine the costs and the benefits associated with each of the two options as well as the implications of accommodating the MNPS requirements. The Group noted that NAT IMG would be making a recommendation to NAT SPG/46 that would include the navigation specification to be used to meet the NAT Region planning requirements and a proposal for the transition from MNPS to RNP. The recommendation would be consistent with plans for the implementation of reduced lateral separation.

Application of 5 minute climb/descend between GNSS equipped aircraft

2.2.12 In follow up to NAT SPG Conclusion 44/4, the 5 minute longitudinal separation minimum between GNSS equipped aircraft had been implemented on 15 January 2009 in the Gander, Reykjavik and Santa Maria Oceanic Control Areas. In response to a request from IFALPA, flight crew guidance material, to be used until the expected amendment to the PANS-ATM (Doc 4444) had been approved. It was intended to include the material in the North Atlantic MNPS Airspace Operations Manual and, in the meantime, the guidelines would be posted on the ICAO EUR/NAT Web site and distributed to all concerned. In this regard, the Group noted that ICAO had circulated State Letter AN 13/2.5-09/45 on 19 June 2009 seeking comments regarding the proposal for amendment to the PANS-ATM (Doc 4444) regarding the 5 minute longitudinal separation minimum between GNSS equipped aircraft.

Reduction longitudinal separation minimum between ADS-C equipped aircraft

2.2.13 The Group was presented with a proposal to improve planning for reduced separation and to ensure that all safety concerns were properly addressed. The Group agreed that, prior to implementing a major revision to aircraft separation standards, including associated "operational trials", a schedule for completion of implementation tasks and proposed policy and procedure documents must be fully coordinated within the NAT SPG working structure. This should apply to the implementation of the 5 minute longitudinal separation minimum using ADS-C as well as the planned reduction in lateral separation.

2.2.14 An implementation plan that showed the schedule for completing tasks required for implementation must be developed and agreed to by all concerned. The implementation plan should address the following basic tasks, as outlined in the *Manual on Airspace Planning Methodology for the Determination of Separation Minima* (Doc 9689):

a) identification of the need for change;

b) determination of the proposed system;

c) identification of the method of safety assessment;

d) evaluation of the risk;

e) satisfaction of safety criteria;

f) modification of the proposed system; and

g) implementation and monitoring of the proposed system.

2.2.15 The Group was informed that to meet the foregoing planning guidelines, Canada and the United Kingdom would provide data regarding the safety work and the performance requirements for the planned implementation and Canada would act as the point of contact to oversee the production of the deliverable (implementation plan) that would be submitted to the NAT IMG as well as to the NAT SOG for comment and approval. This task should be completed in the third quarter of 2009.

2.2.16 The Group noted that, in support of the above, IFALPA had expressed the opinion that a coordinated planning approach was greatly assisted by a transparent planning process. This facilitated the ability of all stakeholders to have a common understanding of the implementation plan and a clear view of when and how they would need to contribute to the overall exercise. IFALPA believed that it was also important that the airspace users have input to the development of criteria (technical, pass/fail, go/no-go) and a reasonable opportunity to confirm that these criteria were being met. Also important was the ability for all stakeholders to plan how they would support the exercise at every phase, which was not possible without a transparent view of the plan and its timeline.

2.2.17 Having agreed on a planning methodology that took account of the concerns raised by ANSPs and airspace users, the Group agreed that it was now able to proceed with planning for a trial to validate the planning assumptions, including the safety requirements. So as not to delay planning, the Group agreed to delegate the decision to proceed with the validation trial to the NAT IMG who would decide in coordination with the NAT SOG. The decision to proceed would be taken when the NAT IMG was satisfied that the planning requirements outlined in paragraph 2.2.14 had been met.

NAT SPG Conclusion 45/9 – Validation trial to sustain 5 minute longitudinal separation using Automatic Dependent Surveillance (ADS) Contract

That the NAT Implementation Management Group (NAT IMG):

a) after satisfying itself that all planning requirements needed to support 5 minute longitudinal separation using ADS-C have been met, determine a date to initiate validation trials;

b) monitor the trial to ensure that safety requirements were being met; and

c) provide the NAT SPG with progress reports.

2.2.18 In addition to planning at the regional level, the Group recognised that it would be necessary to coordinate with ICAO Headquarters to ensure that the separation minima being considered were incorporated into the ICAO provisions as necessary. This might entail coordination with the SASP (paragraph 1.2.11 also refers). The Group noted that the Regional Director of the ICAO EUR/NAT Office would take action on this issue if needed.

Lateral separation

2.2.19 Having agreed to the process that the NAT IMG should use when planning for reductions in longitudinal separation using ADS-C (paragraph 2.2.14 above refers), the Group also endorsed the proposal that the same process be used to support planning for reducing lateral separation.

2.2.20 The Group was informed that, in follow up to NAT SPG Conclusion 44/15 and NAT SPG Conclusion 41/7, the NAT IMG had developed a concept of operations for the implementation of lateral separation of 25 NM. The concept of operations, which took account of the need to maximise the benefits for operators who were already equipped with data link capable avionics and those that equip early, would be implemented in the following three phase:

a) Phase 1 – 2012 – introduce 25 NM lateral separation by implementing ½ degree spacing between the two core tracks, FL350 to FL400 inclusive; only aircraft with the appropriate RNP approval, ADS-C and CPDLC would be permitted to operate on the ½ degree spaced tracks.

b) Phase 2 – 2013 – introduce 25 NM lateral separation by implementing ½ degree spacing through the entire NAT Organised Track System (OTS), FL350 to FL400 inclusive; only aircraft with the appropriate RNP approval, ADS-C and CPDLC would be permitted to operate on the ½ degree spaced tracks.

c) Phase 3 – 2015 – introduce 25 NM lateral separation throughout the entire NAT Region, including for converging and intersecting track situations, between FL350 to FL400 inclusive. The application of the reduced separation standard between targets of opportunity should be permissible in any part of the NAT Region outside the OTS (mixed mode operations).

Note: Phase 2 would likely enable an overall reduction of the lateral extent of the OTS, thereby increasing the flexibility for random operations and providing both economic and environmental benefits.

2.2.21 The Group was informed that IFALPA had expressed the view that both ADS-C and CPDLC were required to support the implementation of reduced lateral separation minimum. IFALPA had clearly stated that a viable, redundant and robust communications navigation and surveillance structure must be in place in order for IFALPA to support the longitudinal and lateral separation reductions planned for the NAT Region.

2.2.22 The Group supported IFALPA's position and agreed that the implementation plan should be based on the requirement for both ADS-C and CPDLC. The Group also endorsed the concept of operations as outlined in paragraph 2.2.20 above and agreed that the NAT IMG should urgently begin addressing the implementation issues, especially documentation and safety studies in order to initiate any required changes to the global provisions.

NAT SPG Conclusion 45/10 – NAT concept of operations to support reducing lateral separation to 25 Nautical Miles (NM)

That the:

a) following concept of operations be used to develop an implementation plan for reducing lateral separation to 25 NM:

i) Phase 1 – 2012 – introduce 25 NM lateral separation by implementing ½ degree spacing between the two core tracks, FL350 to FL400 inclusive; only aircraft with the appropriate RNP approval, Automatic Dependent Surveillance-Contract (ADS-C) and Controller Pilot Data Link Communications (CPDLC) would be permitted to operate on the ½ degree spaced tracks.

ii) Phase 2 – 2013 – expand the introduction of 25 NM lateral separation by implementing ½ degree spacing through the entire NAT Organised Track System (OTS), FL350 to

FL400 inclusive; only aircraft with the appropriate RNP approval, ADS-C and CPDLC would be permitted to operate on the ½ degree spaced tracks.

iii) Phase 3 – 2015 – introduce 25 NM lateral separation throughout the entire NAT Region, including for converging and intersecting track situations, between FL350 to FL400 inclusive. The application of the reduced separation standard between targets of opportunity should be permissible in any part of the NAT Region outside the OTS (mixed mode operations).

b) NAT Implementation Management Group (NAT IMG) develop the following material to support implementation plan for reducing lateral separation to 25 NM:

i) a proposal for amendment to the NAT *Regional Supplementary Procedures* (Doc 7030); and

ii) safety material to so as to initiate the development of global provisions;

c) ICAO Regional Director, Europe and North Atlantic coordinate with ICAO Headquarters in order to initiate the development of global provisions; and

d) NAT IMG provide NAT SPG/46 with a progress report.

Mandate for data link equipage in the NAT Region

2.2.23 In order to obtain the full benefit of implementing the concept of operations outlined in paragraph 2.2.20 above, the Group agreed that it would be necessary to mandate the use of data link equipment required to support the reduction in separation (paragraph 2.2.22 refers). To facilitate the linkage between benefits and the encouragement for operators to equip, the Group agreed that the same geographic/vertical areas being proposed for the implementation of the concept of operations should apply to the areas where data link equipped aircraft would be given priority access. Non-equipped aircraft would be excluded from the airspace concerned.

2.2.24 The Group agreed that the intent of the mandate was to require the use of CPDLC and ADS-C in the area concerned. However, the designated areas would not include airspace where ATS surveillance services (radar and ADS-B) were being provided.

2.2.25 When examining the need and dates for a NAT Region mandate for data link equipage, the Group was cognisant that the EUR Region was finalising its work related to mandating data link equipage. It recalled that this issue was the subject of a European Commission Implementing Rule and that States were obligated to implement "Implementing Rules"; they could not opt out. The equipment being mandated for the EUR Region did not require the complete CPDLC message set nor did it include a requirement for ADS-C; therefore, it would not meet NAT Region requirements. The EUR Region mandate required data link equipage from 7 February 2013 for the core area of the EUR Region and from 5 February 2015 for many of the remaining FIRs. However, aircraft with an individual certificate of airworthiness first issued before 1 January 2014 and fitted with data link equipment certified against requirements specified in RTCA DO-258A/EUROCAE ED-100A (or ED-100) were exempted for the life of that particular airframe. In the discussion, the Group recalled NAT SPG Conclusion 39/10 which states that the desired end state was the implementation of a SARPs compliant Aeronautical Telecommunication Network (ATN) based system.

2.2.26 The representative from IBAC informed the Group that data link equipment for business jet aircraft operating within the NAT airspace would probably not be available or certified in time to meet the data link mandate proposed for the NAT Region. To date Gulfstream aircraft using the GULFSTREAM Software build designated as Certification Delta (or a later approved version) on the Honeywell Primus Epic platform were the only business aviation data link equipment accepted into the NAT FANS service. The NAT SPG should recognize that each of the proposed three NAT data link implementation phases did not have equal costs and benefits, for all airspace users.

2.2.27 The representative from IBAC also stated that, as the implementation progresses the benefits for each new phase would be less and the costs to operators of equipping to maintain access would increase and in fact equipping by business aviation may not even be possible. This problem required closer monitoring and analysis by the NAT IMG during Phase 2 of the implementation strategy in order to assess possible implications and potential penalties to some operators. If it should turn out that the benefit to cost result was too disproportionate and in fact may penalize a portion of the aviation population due to lack of data link equipment; then a decision to defer Phase 3 by several or more years should be made. This rational approach should not delay implementation unnecessarily and yet if it is necessary; it would allow those operators who might be unduly penalized by a premature implementation, to catch up when available technology permits. If the benefit to cost result was not too disproportionate then Phase 3 of the data link implementation timeline could continue as planned.

2.2.28 The representative for IATA stated that it was important for the airline industry that dates be specified in order for the companies concerned to initiate action to comply with the mandate. The NAT SPG Member States agreed with IATA as they needed sufficient notice to initiate regulatory processes which, in some instances, could be lengthy. The Group recognised the position stated by IBAC but, the EUR Region mandate would also affect them; therefore it was agreed that the best solution for all concerned was to mandate data link equipment certified against requirements specified in RTCA DO-258A/EUROCAE ED-100A (or ED-100) for the NAT Region using the same dates as the EUR Region mandate. This should to the extent possible eliminate the need for double equipage. It was therefore agreed that data link equipage should be mandated in the NAT Region effective 7 February 2013 and that all aircraft would need to be equipped by 5 February 2015. The Group also agreed that the NAT IMG, when drafting material to support the mandate, should make provisions to accommodate aircraft that could not be equipped in the time frame.

2.2.29 Regarding the proposed mandate for requiring data link within MNPS airspace, the United States provided the following information. In as much as this was considered a restriction to the North Atlantic airspace structure, current United States Regulations require all proposed restrictions and or changes to said airspace, be reviewed through the United States Notice of Proposed Rule Making (NPRM) process. Understanding that the proposed mandate may only impact routes on an occasional day to day operational basis as routes were planned to enter United States Delegated airspace, the United States could not support the implementation of the mandate within United States Delegated airspace at this time. The FAA has initiated a request to review this requirement as it pertains to delegated international airspace. If after review, it was determined that there was no longer a requirement for an NPRM, the FAA would notify the Regional Director, EUR/NAT Office of ICAO.

NAT SPG Conclusion 45/11 – Mandate for data link equipage in the NAT Region

That the NAT Implementation Management Group (NAT IMG):

a) develop a NAT Region plan to mandate Automatic Dependent Surveillance-Contract (ADS-C) and Controller Pilot Data Link Communications (CPDLC) equipment certified against requirements specified in RTCA DO-258A/EUROCAE ED-100A (or ED-100);

   i) from 7 February 2013, in order to operate on specified tracks within the Organised Track System (OTS); and

   ii) from 5 February 2015 in NAT Minimum Navigation Specifications (MNPS) Airspace;

b) determine the applicable flight level band taking account of the EUR Region mandate;

c) ensures that the plan includes provisions for aircraft not able to be equipped within the above time frame;

d) draft, on behalf of the NAT SPG, a proposal for amendment to the NAT *Regional Supplementary Procedures* (Doc 7030) in order to initiate the processing by 15 December 2009; and

e) provide NAT SPG/46 with a progress report.

2.2.30 The Group noted the importance of ensuring continuing harmonisation between any NAT Region mandates and implementation plans and those established in adjacent regions. Accordingly, it was agreed that the Regional Director, EUR/NAT Office of ICAO should be invited to coordinate, on behalf of the NAT SPG, with adjacent regions to facilitate a mutual understanding and harmonisation of data link equipage requirements and implementation plans.

NAT SPG Conclusion 45/12 – Inter-regional coordination of data link requirements

That the ICAO Regional Director, Europe and North Atlantic, on behalf of the NAT SPG:

a) coordinate with adjacent regions to facilitate a mutual understanding and harmonisation of data link equipage requirements and implementation plans between the NAT and adjacent regions; and

b) provide updates to the NAT SPG to support maintenance of the NAT data link implementation plan.

The Structure and content of the NAT service development roadmap

2.2.31 The Group recalled that, at its 43rd Meeting, it had endorsed a new version of the NAT Service Development Roadmap and the NAT IMG had been tasked with maintaining it. The Roadmap was not to be considered a project management document but as one that clearly stated what planning activities the NAT Region intended to embark upon and it should provide an indication to service providers and airspace users what to expect and when.

2.2.32 The Group was informed that the NAT IMG, when updating the NAT Service Development Roadmap, had found that the presentation was difficult to manage and therefore was not used to the extent that it should. Accordingly, the latest version of the NAT Service Development Roadmap would be converted to a new format which would be divided into two levels. The higher level would be in the form of a flow chart whereas the lower level would be a template for each item on the chart. In addition, the Future ATM Concept of Operations for the North Atlantic Region (NAT Doc 005) would be incorporated into the NAT Service Development Roadmap. It was noted that the revised NAT Service Development Roadmap would be presented to NAT SPG/46 who would be requested to review and endorse the revised Roadmap.

Rate of aircraft equipage

2.2.33 The Group was informed that, in follow up to NAT SPG Conclusion 42/4, the NAT IMG had requested Portugal to acquire the equipage information through a commercial data supplier and that this information would be supplemented by information provided through an IATA survey. The two methods of collecting data would complement each other and improve the overall quality of the data-set therefore providing the required information to update the NAT Service Development Roadmap bi-annually. The Group noted that Portugal was in the process of collating its data and that it should be available by the fall of 2009.

Application of Separation Minima Document

2.2.34 The Group was informed that the NAT IMG had overseen the preparation of an amendment to the Application of Separation Minima (North Atlantic Region) (NAT ASM) which incorporated new provisions for the application of vertical and longitudinal separation. The amendment also included changes

to ensure consistency between the NAT ASM, the NAT *Regional Supplementary Procedures* (*SUPPs)* (Doc 7030) and the PANS-ATM (Doc 4444). The Group agreed that the NAT ASM was in need of updating and therefore agreed that the proposed changes be publish in Edition 2009 on the ICAO EUR/NAT website by 15 July 2009. The Group also agreed that, in the future, the NAT IMG be entrusted with the configuration management of the NAT ASM Document.

NAT SPG Conclusion 45/13 – Amendment to the Application of Separation Minima (North Atlantic Region) (NAT ASM) Document – Edition 2009

That the:

a) Secretariat be requested to published the NAT ASM– Edition 2009 electronically on the EUR/NAT web site by 15 July 2009; and

b) NAT Implementation Management Group oversee the configuration management of the ASM.

Modifications to the airspace requirements for Brest Oceanic Transition Area (BOTA) and Shannon Oceanic Transition Area (SOTA)

2.2.35 The Group was informed that the proposal for amendment to the NAT SUPPs (Doc 7030) which would allow non-MNPS approved aircraft not subject to an oceanic clearance to operate in the BOTA and the SOTA had been submitted to the President of the Council for approval. Considering that the operations envisaged would be in radar and Very High Frequency (VHF) coverage, therefore providing the ability to use less than MNPS separation minima, an operational trial would be conducted to evaluate the operational procedures of the change. On the basis of the results of the trial and once the proposal for amendment has been approved, the change would be operationally implemented and the NAT SPG documentation updated accordingly.

Convening of a NAT airspace users' conference

2.2.36 The Group was informed that, in follow up to NAT SPG Conclusion 42/15, the NAT IMG had reviewed this matter and had agreed that, bearing in mind the economic situation, it would not be opportune to convene such a NAT users' meeting to discuss safety related matters conference at this time. The Group supported the proposal Conclusion 42/15 be closed and that, when the economic situation has improved, consideration be given to convening a users meeting.

NAT SPG Conclusion 45/14 - Convening NAT users meeting

That ICAO, on the basis of a recommendation from the NAT Implementation Management Group (NAT IMG) or of the NAT Safety Oversight Group (NAT SOG) and with the assistance of NAT service providers convene Conferences from time to time to explain to those directly involved with operations in the NAT Region current and future developments, especially those that affect safety.

2.3 NORTH ATLANTIC ECONOMIC AND FINANCIAL GROUP

2.3.1 The Group was advised that the NAT EFG had met twice since NAT SPG/44. The meetings had concentrated on the financial issues related to air navigation service provision, the financial aspects surrounding the provision of data link services, the replacement of the Strumble Height Monitoring Unit (HMU) and possible harmonisation of the charging parameters for air navigation services in the NAT Region.

Financial issues related to air navigation service provision

2.3.2 The Group was informed of the NAT EFG's discussions regarding the significant financial challenges facing the aviation sector and the actions taken by ANSPs to address them. The Group concurred that it was important to fully assess the potential future effects on capacity that could arise from deferred investments in the near term and that care was required to balance the need to reduce costs and avoid unnecessary investments against the need to maintain an acceptable level of service.

2.3.3 The Group noted that the NAT EFG had examined a proposal from NATS, the United Kingdom ANSP, to develop an automation tool to increase the effectiveness and efficiency of the NAT CMA. The NAT EFG confirmed they were satisfied with the information provided and saw no reason why the planned investment should not be made. The resulting costs would be included as a one time expense in the NAT CMA's operating costs which would be recovered in accordance with the Arrangement on the Joint Financing of a North Atlantic Height Monitoring System, Annex, Section 1.

Financial aspects surrounding the provision of data link services

2.3.4 The NAT EFG had noted that the NAT TFG had not convened an interim (Spring 2009) meeting (Summary of Discussions and Conclusions of NAT SPG/44 paragraph 2.3.21 refers). There was a concern regarding the continuing and widening divergence between the NAT TFG´s most recent forecasts and the actual decreases in flights and passenger and cargo revenue in the NAT Region. The lack of reliable forecasting information was making it difficult to address tasks related to developing business cases for data link implementation in the NAT Region. The Group noted the NAT EFG's concerns and recommendations in this regard, and took action as detailed in paragraphs 2.1.2 and 2.1.3.

2.3.5 The Group was advised that the NAT EFG had examined an updated analysis of possible ways to formulate a framework to encourage a transition to data link technologies. The analysis indicated that the transition to data link in the NAT Region had stalled, if not stagnated and provided recommendations regarding a framework for implementing incentives that would encourage operators to equip with data link technology. The Group supported the NAT EFG's opinion that it would be desirable to elaborate a business case to support the data link mandate being implemented for the NAT Region (paragraph 2.2.29 refers). It was noted that different areas of the NAT SPG working structure were aware of various benefits that had already accrued from the implementation of data link and the benefits that were foreseen from implementation plans. The Group concurred that the future implementation plans could be viewed as an incentive strategy for data link equipage. It was also acknowledged that it would be helpful for NAT Region operators to have, in a consolidated form, the rationale for the data link mandate along with the current and future benefits from data link implementation, in order to make equipage decisions and possibly increase the uptake of data link.

NAT SPG Conclusion 45/15 – NAT Region data link implementation business case and incentive strategy

That the NAT Economic and Financial Group, in coordination with the NAT Implementation Management Group:

a) develop a business case to support the planned data link mandate in the NAT Region;

b) develop an incentive framework for operators to comply with the mandate; and

c) report to NAT SPG/46.

2.3.6 The Group noted that the initial coordination would take place directly between the Chairmen of the NAT EFG and the NAT IMG to ensure the NAT EFG was fully apprised of the NAT IMG's plans and any information available regarding the benefits which had accrued or would accrue from the implementation of data link in the NAT Region.

2.3.7 In the course of discussing the above, the Group was advised that some operators were reportedly being charged for both uplink and downlink data link messages; despite the common understanding that charges for uplink messages were assessed to ANSPs. It was agreed that the NAT EFG should examine this issue.

NAT SPG Conclusion 45/16 – Data link charges

That the NAT Economic and Financial Group:

a) examine the charges to operators and to Air Navigation Service Providers for datalink services;

b) determine whether there are possible discrepancies in the charges, and if so, recommend ways to address any identified discrepancies; and

c) report to NAT SPG/46.

Replacement of the Strumble Height Monitoring Unit (HMU)

2.3.8 The Group was informed that the final cost of replacing the Strumble HMU was 1,990,000 GBP, approximately 1 million GBP lower than the previous estimates and that the new HMU was expected to be operational in September 2009. Canada, Iceland, Ireland, Portugal and the United Kingdom were financing the replacement, and would be reimbursed via NAT reduced vertical separation minimum (RVSM) user charges. It was expected that the amounts received by the participating States plus the interest charges should be fully reimbursed after a period of seven years, in 2015.

Possible harmonisation of the charging parameters for air navigation services (ANS) in the NAT Region

2.3.9 The Group was advised of the ongoing review of the results from updated iterations of the NAT Fee Analysis Model (NAT FAM). Once mature, the Model would be used to assist the NAT EFG in determining potential effects from possible harmonization of the various NAT fee structures so as to simplify the charging calculations and increase transparency. It was recalled that this analysis had been undertaken in response to IATA's request that NAT ANSPs investigate whether they could implement a fee calculation process that was more transparent to users.

2.3.10 The model employed an underlying principle that, at the ANSP level, any changes to the charging structure would be revenue neutral. Its input included information from EUROCONTROL, with whom an agreement had been reached to provide data on the basis that it be used only to support this NAT EFG activity. The Group was advised that some additional analysis was required to determine the cause(s) of certain over and under estimations, but the NAT FAM appeared to be providing realistic output. The model did not analyse possible secondary effects, such as operators changing their flight planned routes in order to respond to variances in fee structures.

2.3.11 The Group was advised that, considering the various possible costs and legal and institutional implications for each ANSP to enact changes to their charging mechanisms, IATA had noted it appeared that the possible benefits to the user community would not out-weigh the costs and level of effort that would be involved to change how NAT ANS fees would be calculated. As an alternative, it had been agreed that the next iteration of the NAT FAM should examine the potential effects of harmonising how NAT Region communications costs and charges were calculated with regards to data link operations.

Outcome of the Conference on the Economics of Airports and Air Navigation Services (CEANS)

2.3.12 The Group recalled the decision to present a working paper to Conference on the Economics of Airports and Air Navigation Services (CEANS) which had been held at ICAO Headquarters from 15 to 20 September 2008. to discuss issues being confronted in the NAT Region with regard to ensuring the

availability and sustainability of the necessary infrastructure required for the provision and improvement of air navigation services in the Region (NAT SPG Conclusion 44/12 refers). The working paper requested ICAO to study the ownership and control of the air navigation services infrastructure and develop a draft service level agreement for use by ANSPs to ensure that private third party service providers would perform in line with recognized safety and performance requirements. Both of these suggestions had been supported by the CEANS, and the NAT EFG would be kept informed regarding further developments.

Single European Sky (SES) initiative

2.3.13 The Group was informed that, as part of the Package II of the Single European Sky legislation, performance targets on flight efficiency would be set with regard to route networks through the appointment of a Network Manager. As these targets would be applicable to the European domestic interface with the NAT Region and part of the Santa Maria Oceanic Control Area, it was probable that some knock-on effects would cross the interface. Planning for NAT Region separation reductions would need to take account of the potential impacts on the ability of the European domestic interface ANSPs to meet their performance targets. The Group was advised that this issue had been brought to the attention of the NAT IMG.

Aeronautical frequency spectrum pricing studies

2.3.14 The Group was informed that the United Kingdom Office of Communications (Ofcom) was continuing its review of the results of the consultation initiated with regard to its intention to incentivize the use of frequency spectrum via a pricing mechanism (Summary of Discussions and Conclusions of NAT SPG/44 paragraph 2.2.2 refers). Reportedly, the responses had been overwhelmingly against the Ofcom proposal. It was recalled that this initiative was seen as necessary to address the expected gap between future demands on spectrum and what would be available. A complete analysis of possible effects was difficult because Ofcom had not yet provided a detailed implementation plan, although it had been indicated that no VHF fees would be implemented before 2010. It was expected that Ofcom would begin a new consultation process in September 2009.

The NAT EFG Work Programme

2.3.15 The Group was informed of the NAT EFG's activity to address NAT SPG Conclusion 44/2, which had tasked the NAT EFG to determine ways to ensure an equitable charging mechanism. The NAT EFG had examined input from the NAT IMG and agreed that the number of additional ADS-C messages required and the associated costs to operators was negligible, particularly when assessed against the concomitant safety benefits. IATA confirmed their support also. The NAT EFG then considered the potential costs to ANSPs which would arise from increased data link messages and the investments required to update ground systems to implement the ADS-C reporting regimes. It was agreed that, because safety benefits would accrue to all NAT Region airspace users, it was appropriate to recover such costs from all NAT airspace users, and that rate differentiation was not warranted. The Group agreed this completed the NAT EFG's work regarding NAT SPG Conclusion 44/2 (paragraph 2.4.9 also refers).

2.3.16 The Group recalled that it had tasked the NAT EFG to develop a financial mechanism for funding NAT Regional initiatives (NAT SPG Conclusion 44/5 refers). The possibility of creating a generic framework had been discussed and the NAT EFG's consensus was that this was not feasible because the necessary arrangements should be designed so as to support the particular initiative and which entities (States, ANSPs, third parties or a combination) would provide the services or material. The NAT EFG's recommendation was that it be tasked to develop such mechanisms on a case by case basis, noting that any future financing mechanism should take into account the following points:

a) the development of such agreements should involve consultation with airspace users;

b) future financial mechanisms should include a user consultation process that was fully in compliance with the provisions of ICAO's *Policies on Charges for Airports and Air Navigation Services* (Doc 9082); and

c) the United States was constrained by a requirement that the FAA could only enter into financial agreements with Civil Aviation Authorities (CAAs), not ANSPs;

d) the United States permitted the FAA to provide materials or "services in kind" in scenarios where a financial agreement was not permitted.

2.3.17 The Group concurred with the NAT EFG's analysis and agreed this completed the NAT EFG's tasking with regards to NAT SPG Conclusion 44/5.

2.3.18 The Group was advised that it was no longer possible for the NAT EFG to reliably detect the effects of the Open Skies Agreement, given the significant impacts being felt in the aviation sector from the deepening economic downturn, changes in currency values, changes in fuel prices and falling level of consumer confidence. As it was no longer appropriate to track this as a specific task the Group agreed to update the NAT EFG work programme to include the more general task "Monitor and analyse the financial and economic impact of emerging aviation trends that might impact NAT operations".

2.3.19 In consideration of the above, it was agreed that future work of the NAT EFG should concentrate on:

a) assist the NAT IMG with the economic and financial implications of its work;

b) analyse financial and cost recovery issues related to regional safety related initiatives;

c) follow up the replacement of the Strumble HMU;

d) develop mechanisms to fund NAT Regional initiatives as and when required;

e) analyse possible incentive strategies to encourage data link uptake;

f) examine possible discrepancies in data link charges;

g) analyse possible harmonisation of charging formulae in the NAT Region; and

h) monitor and analyse the financial and economic impact of emerging aviation trends that might impact NAT operations.

2.4 DATA LINK IMPLEMENTATION MATTERS

ADS-C implementation plan for conformance monitoring

2.4.1 The Group reviewed a report on actions undertaken in response to the NAT SPG Conclusion 44/2 on the implementation of ADS-C for conformance monitoring. The Group noted that in addressing Conclusion 44/2, a set of ADS-C contracts that could be implemented to permit the use of ADS-C for conformance monitoring had been examined. It was acknowledged that the conformance monitoring function of ADS-C could be implemented using the current avionics but some changes would be required to Air Traffic Control (ATC) automation.

2.4.2 The Group noted that the NAT IMG in reviewing all three types of conformance monitoring, lateral, longitudinal and vertical, had agreed, that considering the urgency of reducing risk as soon as possible, the first priority was vertical conformance monitoring which should provide a means to significantly reduce the cause of the greatest contributor to risk, aircraft operating at the wrong flight level for long periods of time.

2.4.3 As for lateral conformance monitoring, practically all of the risk of Gross Navigation Errors (GNE) by ADS-C flights could be removed by means of ADS-C Waypoint Change event reporting. More of that risk would be removed as ADS-C periodic reporting rates were increased in support of reductions in longitudinal separation. Nevertheless it might be cost beneficial to reduce the risk still further through use of Lateral Deviation Event contracts. The Group noted that the NAT IMG planned to look at this issue in more detail as part of the second phase of conformance monitoring using ADS-C.

2.4.4 Implementation of longitudinal conformance monitoring would be an inherent part of the planned ADS-C enhancements in 2009 to support a trial of reduced longitudinal separation. Further NAT region planning in this regard would he held in abeyance until more was learned through that trial.

2.4.5 The Group noted that changes to the ground systems would be carried out in accordance with the regional principles as developed and agreed by the NAT IMG.

2.4.6 With these assumptions in mind a planning timeline was developed. In line with the timeline, most ANSPs were expected to implement altitude range event contracts by the end of 2010. As regards the implementation of lateral deviation event contracts, it was expected that most ANSPs would have the capability to implement it by the end of 2011.

2.4.7 Taking into account that the vertical conformance monitoring had already begun to be implemented, the Group agreed to task the NAT SOG to begin assessing whether vertical risk due to incorrect flight levels was being reduced.

2.4.8 The Group noted that in support of the work to determine an equitable charging mechanism in connection with the ADS-C use for conformance monitoring, the following estimates were determined for the increase in the ADS-C message traffic due to the implementation of the ADS-C use for conformance monitoring:

a) Vertical conformance monitoring

Presently in all NAT FIRs vertical conformance monitoring is based on ADS-C waypoint reports, but such monitoring provides updates only at waypoints. To better monitor vertical conformance there was a need to use ADS-C Altitude Range Event reports. Only an Area Control Centre (ACC) in control of a flight should request such reports. The initial request in each FIR will be part of the regular ADS-C contract request. Only in the event of a climb or descent will there be any increase to the number of ADS-C messages. This would typically consist of 6 messages: two contract requests (uplinks), two contract acknowledgements (downlinks) and two ADS-C event reports (downlinks). Typically one in every eight flights receives a climb instruction from Gander ACC. Taking that as a basis, the increase in ADS-C message traffic would come to about **one message per NAT crossing** on average.

b) *Lateral conformance monitoring*

Presently in all NAT FIRs lateral conformance monitoring is based on ADS-C waypoint change event reports. In future there may be additional monitoring by means of Lateral deviation Change Event contracts. Those will not require any additional uplinks nor will they produce any additional reports except in the rare cases of substantial deviations. Therefore **no significant increase** in ADS-C message traffic per flight will be produced.

c) *Longitudinal conformance monitoring*

Presently in all NAT FIRs longitudinal conformance monitoring is based on ADS-C waypoint reports. When reduced longitudinal separation is implemented there will be a need for additional longitudinal conformance monitoring based on ADS-C periodic reports from each participating flight: one report every 23 minutes or so. Presently most NAT flights provide periodic reports for

wind/temperature data every 30 minutes. Therefore an increase of no more than one report every 60 minutes could be projected, which would come to about **3 reports per NAT crossing**.

2.4.9 In conclusion, the Group noted that there would not be any significant extra cost associated with the implementation of ADS-C use for conformance monitoring. There will be a slight cost increase due to conformance monitoring but this would be offset by the safety benefits obtained by this implementation (paragraph 2.3.15 also refers).

2.4.10 The Group was informed about an existing technical functionality for automatic generation of ADS Emergency report, including the position of the aircraft, under circumstances where aircraft did not have any other ADS contracts in place. The Group felt that this functionality should be further investigated because, if proven feasible, it could significantly facilitate search and rescue operations and assist in accident investigation.

Requirements for the NAT data link central monitoring agency

2.4.11 The Group was provided with an update on the activities of the NAT Future Air Navigation Systems (FANS) Central Monitoring Agency (NAT FCMA), and in particular the difficulties that it was undergoing.

2.4.12 The Group recalled that the NAT FCMA had been established by Canada and the United Kingdom in order to support initial implementation of data link based applications in the NAT Region. It was noted that recently the NAT FCMA was experiencing staffing and financing difficulties that effectively caused some of the functions of the NAT FCMA to cease. In essence, the NAT FCMA had become ineffective, except for certain continuing and much appreciated activities conducted by the United Kingdom. As a consequence, the regional central data link monitoring function was not being carried out in the NAT Region to the full extent as it was envisioned by the NAT FCMA Terms of Reference or required by NAT SPG Conclusion 42/6.

2.4.13 The Group recalled that because the safety of the proposed reductions in separation minima, as well as other data link applications, hinged on the performance of the ADS and CPDLC infrastructure, performance monitoring was an essential component of the overall system and the continued viability of the NAT FCMA was indispensable. In addition to the need to ensure that the communications infrastructure was performing in accordance with the requirements of the safety case, Annex 11 (Annex 11, paragraph 2.27.5 refers) required post implementation monitoring of communication services to meet safety targets must be in place to support ATS applications using data link technology. Therefore, urgent action was needed in order to establish a replacement regional body that would subsume the previously defined tasks of the NAT FCMA and take on the additional task of system performance monitoring and reporting required to support data link applications in general and the proposed reductions in separation minima in particular.

2.4.14 The Group noted that the NAT DLMA would require highly specialized tools to enable it to identify, isolate and correct problems at the source. It was also highlighted that the NAT DLMA would not be a separate entity from the participating stakeholders. The individual States/ANSPs would need to provide the data and information, and analysis that would portray actual regional performance measures. The Group noted that operators, CSPs, airframe manufacturers and equipment suppliers would need to participate in resolving identified problems (paragraph 1.3.18 also refers).

2.4.15 In regard to the reporting lines of the NAT DLMA, the Group recalled that, when approving the revised structure of the NAT SPG (NAT SPG Conclusion 45/2 refers), it had agreed that, because of the specialised engineering expertise required to carry out the analysis, the NAT DLMA should report to NAT IMG. The Terms of Reference of the NAT DLMA are shown in **Appendix E**. Safety related concerns would be shared with the NAT SOG so that mitigation or action could be jointly determined if required and the effects of the mitigation measured.

2.4.16 The Group recognised that in order for the NAT DLMA to fulfil its role as outlined in the terms of reference and list of ongoing activities, the following would apply:

a) States would need to ensure that the DLMA has the required tools and personnel with the technical skills and experience to carry out the required functions; and

b) States should ensure that the agency is adequately funded to carry out its required functions.

2.4.17 In line with the foregoing, the Group accepted with appreciation the proposal made by the Representative of the United States to take up the responsibilities for the provision of the NAT DLMA functions in accordance with the terms of reference and list of ongoing activities. The Group noted that this service would be provided as an extension of the existing and similar service provided by the United States in the ICAO ASIA/PAC Regions and that there would not be any costs associated with the provision of this service neither to the service providers nor airspace users. The Group noted that more detailed information on this issue would be provided to the next NAT IMG meeting.

NAT SPG Conclusion 45/17 - Establishment of a NAT Data Link Monitoring Agency (NAT DLMA)

That the:

a) United States establish by 31 December 2009 a NAT DLMA;

b) NAT Implementation Management Group coordinate all safety related matters with the NAT Safety Oversight Group; and

c) NAT IMG provide a report to NAT SPG/46.

NAT SPG Conclusion 45/18 - State and Air Navigation Service Provider (ANSP) support to the NAT Data Link Monitoring Agency (NAT DLMA)

That the Regional Director of the ICAO European and North Atlantic Office invite States, ANSPs, Communications Service Providers, airspace users and industry to support the work of the NAT Data Link Monitoring Agency.

2.4.18 The Group noted that the NAT FCMA would continue to function until the NAT DLMA was fully established and thanked Canada and the United Kingdom for their role in initial implementation and development of the regional data link monitoring function.

2.4.19 In addition, the Group noted that in order to carry out the required system performance monitoring and reporting as soon as possible, it would be necessary to urgently finalise the monitoring requirements and establish a timeline for when the NAT ANSPs would implement data collection mechanisms in their ground systems. It was recalled that data link monitoring requirements were being finalised within the scope of the common global performance based data link guidance material being developed for inclusion in the *Global Operational Data Link Document* (GOLD) (NAT SPG Conclusion 44/9 refers). In accordance with NAT SPG Conclusion 44/8, the GOLD, once approved by all concerned, would be used to document system performance monitoring and reporting requirements. The GOLD would also provide formats for the data to ensure that global interchange was consistent and to facilitate automated data collection within each individual ANSP's Flight Data Processing System (FDPS) to create a consistent regional performance picture.

2.4.20 The Group noted that version 0.4.3 of the GOLD had been produced for internal review and that the document was planned to be made available for a broader review in July 2009. It was expected that the final version of the GOLD should be available for approval by the end of 2009. The Group agreed that the GOLD, when it was endorsed by NAT IMG, should replace the *Guidance Material for ATS Data Link Services in North Atlantic Airspace* and would serve as the basis for data link monitoring in the NAT Region.

It was noted that a global configuration management process would be put in place by ICAO whereby the document would be maintained in coordination between the concerned PIRGs and the ICAO Secretariat.

NAT SPG Conclusion 45/19 - Global Operational Data Link Document

That the NAT Implementation Management Group (NAT IMG):

a) review the final version of the *Global Operational Data Link Document* (GOLD) with the aim to replace the *Guidance Material for ATS Data Link Services in North Atlantic Airspace*;

b) provide a report to NAT SPG/46.

Proposal for Amendment to the NAT Regional Supplementary Procedures (SUPPs) (Doc 7030) regarding the mandatory inclusion of the aircraft call sign in the ICAO FPL

2.4.21 The Group was informed that the aircraft registration of flights wishing to avail themselves of data link services was required because it was needed by the ground systems to unambiguously correlate an aircraft's logon with its flight plan as part of the establishment of FANS connectivity. This information was needed to support ADS-C and/or CPDLC applications, both of which were cornerstones of the NAT Service Development Roadmap. The only reliable source for this information was the aircraft registration when included in the ICAO FPL.

2.4.22 The Group recalled that the current requirement for all RVSM approved aircraft planning to operate in NAT Region was to include the registration in item 18 of the flight plan for monitoring purposes and that this requirement did not extend to other types of operations which might require the aircraft registration. Therefore, it was necessary to expand the requirement to include the aircraft registration in the ICAO FPL to other types of operations.

2.4.23 The Group therefore endorsed the draft proposal for amendment to the NAT SUPPs (Doc 7030) regarding the mandatory inclusion of the aircraft registration in the ICAO FPL, as shown in **Appendix I**. The Group agreed that Iceland should submit the proposal for amendment on behalf of the NAT SPG to the ICAO EUR/NAT Office for formal processing. The Group noted that, when developing the proposal for amendment, cognisance was taken by the NAT IMG of the need for global applicability of using the aircraft registration to correlate an aircraft to enable the provision of data link services. In addition, the proposal for amendment would only apply to aircraft wishing to avail themselves of the data link services provided in the NAT Region.

NAT SPG Conclusion 45/20 - Amendment to the NAT Regional Supplementary Procedures (SUPPs) regarding the inclusion of the aircraft registration in the ICAO Filed Flight Plan (FPL)

That the Representative of Iceland, on behalf of the NAT SPG, make arrangements within his administration to process the proposal for amendment to the NAT SUPPs, as shown in **Appendix I** to this report, regarding the requirement for the mandatory inclusion of the aircraft registration in the ICAO Filed Flight Plan (FPL) for all aircraft wishing to avail themselves of data link services in the NAT Region.

Operational status of data link applications

2.4.24 The Group recalled that NAT SPG Conclusion 42/6 provides guidance as to when and how the ADS and CPDLC trials could be declared operational. The Group noted that the NAT IMG, based on the caveats of Conclusion 42/6, had determined that no obstacles remained to prevent declaring the service operational. However, one of the conditions was to have annual NAT FCMA reports. Because the NAT

FCMA was not operating, the Group supported the NAT IMG proposal that the system would only be declared operational when the new NAT DLMA became operational (paragraph 2.4.17 refers).

2.5 OTHER ISSUES

Optimisation of NAT communications resources

2.5.1 The Group was provided with a progress report on actions undertaken in response to NAT SPG Conclusion 44/14 on optimization of voice communications resources. The Group noted that in addressing NAT SPG Conclusion 44/14, the NAT IMG had agreed that any communications strategy required to meet operational expectations for HF should include two areas of activity. The first action would be to allocate additional frequencies to HF stations that could be used without any additional investments into ground infrastructure. An action plan had been developed by the NAT ACG and presented for the endorsement of the Group (paragraph 3.2.5 refers).

2.5.2 The second action was to optimise the use of HF voice communications resources as an integral part of the NAT Communications Strategy. In this regard, the Group was presented with the Communications Strategy which included the steps to be followed in order, among other issues, to optimise the use of NAT region voice communications resources. In addition, the NAT Communications Strategy addressed other issues of relevance to the improvement of efficiency in the NAT Region, from both an economic and environmental perspective.

2.5.3 The Group noted the steps that were geared towards reducing the number of so-called HF nuisance messages and a study on technical ramifications of any reduction of Selective Calling System (SELCAL) checks. The Group noted that resolving the issue of HF nuisance messages was expected to reduce the load on the HF voice communication system by approximately 5-10 %.

2.5.4 The Group noted that the NAT Communications Strategy would be incorporated into the NAT Service Development Roadmap and that the NAT IMG had also agreed that all of the possibilities identified by the Communications Strategy should be pursued. Accordingly, the NAT IMG working groups were tasked to address this matter with urgency so that the communications system would be able to cope with the increased traffic that would occur as the economy improved.

2.5.5 As regards the possibility of reducing the number of SELCAL checks, the Group noted that the NAT IMG, in conjunction with the ICAO Secretariat, will conduct a review of the requirements for SELCAL check in the NAT Region in the context of Annex 10 provisions and other relevant material. Based on that review, the current operational/regulatory requirements for SELCAL checks in the NAT Region would be reviewed.

2.5.6 Based on the foregoing, the Group agreed that NAT SPG Conclusion 44/14 should remain extant and that a progress report should be made to NAT SPG/46.

3. AIR NAVIGATION SYSTEM REVIEW

3.1 SAFETY MANAGEMENT

NAT SAFETY MANAGEMENT COORDINATION GROUP

Report on Safety Management Matters

3.1.1 The Group was advised that the NAT SMCG had noted that NAT SPG Symposium on Structure and Working Methods had proposed a new approach to managing safety on a regional basis. The resulting new NAT SPG structure provided a distinction between the safety oversight and implementation

aspects of the NAT Region air navigation system and enabled a regional methodology to manage air navigation system safety through the establishment of the NAT SOG to oversee the safety of NAT airspace with the assistance of the NAT SG and the NAT MWG (paragraphs 1.3.26 through 1.3.28 refer). As a result of the NAT SOG's composition, which would include regulators and National Supervisory Authorities (NSA), the NAT SPG would have mechanisms to address issues with User States and States of registry for "problem" operators.

3.1.2 With regard to the new structure, the NAT SMCG offered the following general comments:

a) A standardized way of presenting safety cases should be developed. Such safety cases should include clear statements regarding communications, navigation and surveillance performance requirements.

b) Management and control of documents currently managed by the NAT SMCG should be reviewed in the new structure.

c) A TLS should continue to be used as a system design parameter to describe the acceptable safety threshold. The system should be designed to operate at or below the TLS.

d) Safety performance indicators should be developed to measure NAT Region safety performance in a transparent manner and be harmonized with global safety performance indicators, when they were developed and implemented.

e) The work of the NAT SOG should focus both on air navigation services and flight operations.

f) The reports of the NAT SPG contributory groups should clearly identify safety management related issues in order to facilitate the exchange of safety management information between all groups.

g) The scheduling of the NAT SOG and its subgroups should take into account the advantages of having all required expertise available for overlapping meetings until such a time as the NAT SOG determines that a different working method is preferable.

3.1.3 The Group was advised that these comments would be brought to the attention of the NAT SOG.

3.1.4 The NAT SMCG had also emphasized the need to implement a "fast track" process to ensure the NAT IMG was made immediately aware of any issues or developing trends that required immediate intervention. The Group noted this concern had been addressed when revising the structure of the NAT IMG and in implementing a process to facilitate the exchange of safety information (paragraphs 1.3.23 and 1.3.27 refer).

Coordination between the NAT SMCG and the NAT IMG

3.1.5 The Group noted that in accordance with NAT SPG Conclusions 44/26 and 44/27, there had been close coordination between the NAT SMCG and the NAT IMG regarding safety management issues. Recommendations and observations had been provided to the NAT IMG and the results of the subsequent reviews had been provided to the NAT SMCG. In this way, progress was tracked by the NAT IMG, work programmes modified as required, and feedback provided to the NAT SMCG with minimal delays.

3.1.6 The Group noted that inter-facility coordination issues had been a particular focus, due to their major contribution to vertical errors. Complementary to the work of the Air Traffic Services (ATS) Inter-Facility Data Communication (AIDC) Task Force, the processes and procedures related to alerting and confirming whether coordination has taken place had been reviewed. A number of processes had been

initiated or were planned to take advantage of the availability of electronic flight data to facilitate detection of coordination errors.

3.1.7 The Group was advised that conformance checking processes had been under review. With particular regard to the use of ADS-C data, work was underway to use the capabilities of ADS-C event contracts to initiate reports when there are deviations from the cleared flight profile and to use the currently available ADS-C position and periodic reports to better advantage for conformance checking (paragraphs 2.4.1 through 2.4.9 refer). The generation and display of conformance alerts were being reviewed and improved to reduce or eliminate the chance that one conformance alert would mask another.

3.1.8 The Group noted that information regarding NAT Region procedures had been prepared or updated so as to facilitate understanding by flight crews and various procedures were under review. A detailed study of the phraseology used in the NAT Region had been initiated to facilitate identification of best practices and harmonization wherever possible. The procedures, phraseology and monitoring of conditional clearances was another area of particular focus.

3.1.9 The Group recalled that the NAT SMCG had promulgated three documents, and that the responsibility for them would need to be determined in view of the changed working structure of the NAT SPG. It was agreed that this task was properly the remit of the NAT SOG.

NAT SPG Conclusion 45/21 – Update of documents currently promulgated by the NAT Safety Management Coordination Group

That:

a) the NAT Safety Oversight Group (NAT SOG) review the Oceanic Errors Safety Bulletin (OESB), the Sample Oceanic Checklist and the Sample Oceanic Expanded Checklist;

b) determine a mechanism to regularly review and update the content; and

c) inform NAT SPG/46.

3.1.10 The Group was informed that the availability of automated position reports had made timely detection of errors possible. As well, the ability to communicate via CPDLC allowed situations to be clarified and resolved quickly. These were important safety benefits arising from the NAT SPG data link programme.

3.1.11 The Group was informed that the NAT SMCG had discussed a particular area of concern arising from the plans to reduce lateral separation in the NAT Region, particularly the intention to apply the reduced lateral separation by spacing near parallel tracks by ½ degree of latitude. It was noted this would involve an increased use of waypoints made up of degrees and minutes (for example, 43º30’ North) rather than the current situation whereby most waypoints would consist of whole degrees of latitude and longitude. There continue to be navigational errors arising from flight crews not displaying and verifying the full geographic coordinate and from mistaking a “half degree” coordinate (for example, 48º30’ North) as a full coordinate, due to similarities in presentation of the ARINC 424 waypoint names. This is viewed as a significant hazard that could arise from the planned implementation of reduced lateral spacing between tracks. The Group agreed this potential error type should be taken into account during the safety studies that would be conducted to support the planned implementation and that care should be taken to include a robust plan to capture and contain such errors as part of the implementation planning.

NAT SPG Conclusion 45/22 – Implementation planning for reduced lateral separation

That the NAT Implementation Management Group:

a) ensure that the errors arising from the input and display of ½ degree coordinates (for example, 48º30' North) are subject to specific hazard analysis and mitigation developed to address the identified hazards;

b) develop a robust plan to capture and contain errors arising from flight crews misconstruing ½ degree coordinates as a full degree coordinate or vice versa (for example, flying to 43º30' rather than 43º00' or vice versa); and

c) ensure that the results of a) and b) are an integral part of the implementation plan for reduced lateral separation.

3.1.12 The Group was informed that the NAT SMCG had benefited from the capabilities of the NAT Deviations and Errors Monitoring Application (NAT DEMA), a data base application for the storing, organizing and reporting of safety data. One ANSP was using a version of the tool to directly submit occurrence reports to the NAT CMA within the application whilst another was working towards this capability. Canada, which had developed NAT DEMA, indicated its willingness to continue supporting the application and upgrading it, as required, to support the work of the NAT SPG. It was noted that the NAT DEMA could be used to store all safety related data for the NAT Region and as a means of communicating safety information between the NAT SPG contributory groups.

3.1.13 The Group was informed that the NAT SMCG continued to regret the absence of participation from Spain when reviewing occurrences at or near the interfaces with Madrid ACC or involving Spanish registered operators. The Group agreed that coordinated action to mitigate errors in this area would not be possible without the assistance of Spain to understand the reasons for the errors and to develop appropriate mitigation.

NAT SPG Conclusion 45/23 – Request to Spain to participate in NAT Region safety management and implementation activities

That, recognising the need for all concerned parties to work together to understand and resolve safety management issues, the ICAO Regional Director, Europe and North Atlantic, invite Spain to actively participate in the safety management and implementation activities of the NAT SPG.

3.1.14 The observer from Spain advised the Group that a tripartite meeting had taken place between representatives from Madrid, Santa Maria and Prestwick area control centres. Spain indicated its commitment to participate in the NAT SPG and the appropriate working groups.

Proposed subjects for NAT Safety Related Information

3.1.15 In accordance with NAT SPG Conclusion 44/32, which invited the NAT SMCG to propose subjects for a yearly NAT Safety Related Information bulletin, the following were identified as areas to be covered:

a) how to correctly execute conditional clearances;

b) cautions arising from cases where the inability to attain or maintain the cleared flight level had resulted in vertical errors;

c) the need to verify the full coordinate when checking stored points in the FMS against route clearances;

d) where to find the information related to the correct application of contingency procedures; and

e) the importance of being familiar with the current NAT operating procedures and advice regarding where to find current information.

3.1.16 The Group noted that the above would be brought to the attention of the NAT SOG.

REPORT ON SCRUTINY MATTERS[1]

Vertical navigation performance in the NAT Region during the period 1 January 2008 to 31 December 2008

3.1.17 The Group was informed that reports of altitude deviations of 300 feet or more which had been submitted to the NAT CMA had been reviewed by the NAT SMCG. The reports were used to identify possible or actual trends which might have contributed to vertical errors or affected the severity of the vertical risk in NAT MNPS airspace arising from such errors. ATC coordination errors, non-compliance with ATC clearances or restrictions, turbulence, ambient temperature and aircraft technical defects were the major causes of risk bearing errors in 2008.

3.1.18 The Group noted that the scrutiny process highlighted that ATC coordination errors continued to be an area of concern due to their contribution to vertical risk in the NAT Region in 2008 (paragraph 3.1.65 also refers). Such reports, including those involving automated data transfer, totalled 45 events accounting for 113 minutes at un-cleared level, as compared with 34 events for 273 minutes in 2007 – an increase in the number of reported events but a significant decrease in accumulated time at un-cleared flight level. The other significant event-types contributed to a total of 378 minutes at un-cleared level in 2008 and 187 minutes in 2007.

3.1.19 The Group was advised that non-compliance with ATC clearances or restrictions had become a significant contributor to vertical risk with 46 reported events, (27 in 2007) resulting in a total time of 366 minutes at un-cleared level (140 minutes in 2007) (paragraph 3.1.77 also refers). Of these events, 4 (18 in 2007) resulted in aircraft entering oceanic airspace not at their cleared flight level. Non-classified crew actions accounted for 2 events in 2008 as compared to 12 in 2007.

3.1.20 Turbulence, air temperature and aircraft technical defects accounted for 5 events (11 events in 2007), resulting in a total time at un-cleared level of 12 minutes (47 minutes in 2007).

Lateral Navigation Performance in the NAT Region during the period 1 January to 31 December 2008

3.1.21 The Group noted that the scrutiny of observed GNE in the NAT Region was completed and found that a total of 28 errors were committed in 2008 as compared to 31 in 2007. Of these, 4 (9 in 2007) occurred outside NAT MNPS Airspace and were therefore classified as Table Charlie errors. A further 24 (20 in 2007) were not eligible for inclusion in the risk analysis as defined by NAT SPG/17 and amended by NAT SPG/23; accordingly, they were classified as Table Bravo errors. There were no risks bearing errors (Table Alpha errors) as compared with 2 such events in 2007.

3.1.22 The Group was informed that there were 148 reported Interventions to Prevent a GNE in 2008, compared to 139 such reports in 2007. Since January 2007, this category had been further refined, with lateral deviations of less than 25 NM being reported. In 2008, 123 of the Interventions to Prevent a GNE could be considered to be completely successful with no lateral deviation occurring, and a further 25 took place after aircraft had departed from cleared track but with a maximum lateral error of less than 25 NM.

[1] For detailed discussions and analysis of vertical and lateral navigation performance, reference should be made to the reports of the NAT SMCG which were presented to NAT SPG/45.

3.1.23 The Group noted that the scrutiny process was able to determine that 148 potential or actual lateral errors in 2008 (99 in 2007) were attributable to crew error or probable crew error. This included 95 events (73 in 2007) where the filed flight plan, rather than the ATC clearance, had been followed. 19 cases (8 in 2007) were determined to be attributable to ATC or Clearance Delivery Officer (CDO) errors.

Erosion of longitudinal separation

3.1.24 The Group was informed that thirty-three (33) reports were received in 2008 (13 in 2007) regarding occurrences of erosion of longitudinal separation in excess of three minutes.

MATHEMATICAL MATTERS [2]

General

3.1.25 To assist the NAT SPG in reviewing system safety performance, the NAT MWG was convened with the principal objectives of:

a) providing the NAT SPG with the estimates of lateral and vertical collision risk for the 2008 calendar year;

b) reviewing the ongoing monitoring of the risk in NAT MNPS airspace, including the height keeping performance and large height deviations of aircraft approved to fly in that airspace; and

c) improving the methods used to estimate lateral and vertical risk.

3.1.26 The Group was informed that the NAT MWG met from 27 April to 1 May 2009, following the meeting of the NAT SMCG, in order to provide continuity between the groups. Some members of the NAT MWG also attended the NAT SMCG, in which lateral, vertical and longitudinal events were reviewed for the period 2008 and the first quarter of 2009. It was noted that the NAT MWG meeting had not been attended by a representative from IATA (IATA last participated in the work of the NAT MWG at its forty-first meeting in 2005). It was hoped that an IATA representative would be able to attend next year's meeting as operational input into the discussions and conclusions was greatly valued by the NAT MWG. Equally, the representative from IFALPA was unable to attend this meeting and their contributions were missed as well.

New Terms of Reference

3.1.27 The NAT MWG edited its draft terms of reference as offered by the ICAO Secretariat, reflecting the realignment within the new NAT SPG structure. In redrafting of the terms of reference he NAT MWG felt that there was considerable value in summarizing performance of the contributing elements, as was often done in its annual report. Additionally, the changes to the terms of reference reflected the close cooperation between the NAT SG and the NAT MWG as it was the source vital operational data on performance. It was noted that these areas of work were in accordance with the high-level description of the "Performance Monitoring and Assessment" contained in the Symposium report.

3.1.28 In this respect, it was outlined that performance monitoring of the many factors within the system would become of increasing importance as future operations would rely on service providers for the delivery of communication, navigation and surveillance. Concern was expressed by members of the MWG as to how that data would be specified, collected and distributed to the safety oversight part of the NAT SPG organization. It was expected that the NAT SPG would provide for a delivery of data services within the IMG-managed structure. In particular, the NAT SPG reassured the NAT MWG that rapid acquisition of data

[2] For the detailed discussions and analysis of vertical and lateral navigation performance, reference should be made to the Mathematicians' Working Group report which had been presented to NAT SPG/45.

(that may be required to assess change to a component of the system so that it might be assessed) would be ensured, together with a direct exchange of information amongst the various groups within the new organisational structure.

2008 lateral and vertical collision risk estimates

Lateral Risk

3.1.29 The occupancy estimates for the year were based on the full twelve months of 2008, as were the error rates used in the risk estimates. NAV CANADA and United Kingdom NATS presented the lateral occupancy estimates for 2008 based on the traffic weighted average of the United Kingdom 20°W estimates, the Canadian 40°W estimates and the traffic-weighted average of both Canadian and United Kingdom 30°W estimates. The estimates were based on data obtained from the Gander Automated Air Traffic System (GAATS) and the Shanwick Automated Air Traffic System (SAATS) for the 4th and 15th day of each month. These systems had enabled a full 24 day sample period to be used in the 2008 estimation.

3.1.30 It was noted that the NAT OTS, random and combined occupancies had decreased slightly compared to those observed in 2007 (although these had generally been increasing since 2003). It was also noted that both United Kingdom and Canada provided traffic figures showed an increasing number of flights classified as "random". In commenting this finding, the IATA representative stated that this trend should be expected to continue/increase as more airlines would prefer to fly random routes, instead of following the NAT OTS, for economical reasons.

3.1.31 The MNPS GNEs reported in 2008 were examined in conjunction with the NAT SMCG, immediately prior to the NAT MWG (with many of the NAT MWG members present). This ensured that the two groups were in agreement over the categorisation and weighting of the events for risk assessment purposes (paragraph 1.3.28 also refers). The analysis of the GNEs showed that there were no risk-bearing GNEs reported at the Gander, Shanwick or Reykjavik monitoring windows during 2008. This had resulted in the five-year rolling average of the lateral collision risk estimate decreasing from 0.62 to 0.56 x 10^{-9} fatal accidents per flight hour (fapfh).

3.1.32 A comparison of the weighted risk-bearing error rates between 2002 and 2008 showed that the weighted risk-bearing error rate for all of these years was below the maximum acceptable level as set out in the corresponding NAT MNPS lateral error rate requirement of 1.3 x 10^{-4} errors per flight (the MNPS zeta criterion).

3.1.33 The Group noted as well that all the lateral collision risk estimates between 2002 and 2008 were below the TLS for the lateral dimension, which was currently 20 x 10^{-9} fapfh.

3.1.34 Although no risk bearing GNEs had been reported during 2008, the meeting noted that no method had yet been developed for incorporating the number of aircraft that transited Reykjavik oceanic airspace but did not enter Gander or Shanwick oceanic airspaces, although Iceland had provided the necessary raw data to NAV CANADA. As per discussions in NAT SPG/42 and NAT MWG/43, it was agreed that the NAT MWG should work towards incorporating this data in order to bring the error and traffic base figures into alignment.

Lateral Overlap Probability $P_y(0)$

3.1.35 The Group recalled that a key parameter used in calculations of vertical (and longitudinal) operational and technical risk was the lateral overlap probability, $P_y(0)$. The collision risks would change in direct proportion to this value (e.g. halving $P_y(0)$ would halve the collision risk, everything else being equal).

3.1.36 The Group also recalled that NAT MWG reported increases of $P_y(0)$ over the years. An increase in $P_y(0)$ reflected improvements in lateral navigational performance occasioned by the use of current-technology navigational systems, i.e. GNSS. A new estimate of $P_y(0)$ was presented by United Kingdom NATS using a 12-month sample (January to December 2008) of individual cross track errors collected from Irish radar at the oceanic boundary. By applying the Empirical Distribution Method (described in the NAT SPG/43 WP/05), $P_y(0)$ was estimated to be 0.1041. It was noted that the revised estimate of $P_y(0)$ using updated data was very similar to the last agreed value from 2006 and therefore the meeting agreed that the value of 0.1172 should continue to be used. The NAT MWG would continue to review the value annually.

Evidence of Strategic Lateral Offsets

3.1.37 SLOP came into effect in the NAT Region during 2004. SLOP was designed to be a standard operating procedure specifically used to spread aircraft out laterally about their tracks, in order to minimise the chance of collision given an operational error or contingency procedure. The spreading of the lateral navigational density would have beneficial effects to the risk of collision in both the vertical and longitudinal dimensions, by consequently reducing the $P_y(0)$ estimate.

3.1.38 The optimal benefit would result for an equal distribution of aircraft across all three of the SLOP options: centreline, 1 NM to the right and 2 NM to the right of centreline. This equal distribution would be best achieved by randomising the choice of options each time SLOP was applied. Therefore, for the technique to minimise risk effectively, pilots would need to have the flexibility to randomly select their options.

3.1.39 The Group noted that some airlines were specifying a fixed offset when incorporating the SLOP into their company standard procedure. Whilst this could be seen as positive in increasing the initial SLOP uptake, if all airlines would use the same fixed offset then the beneficial effects of SLOP would be erased for same direction traffic and greatly reduced for opposite direction traffic.

3.1.40 The NAT MWG stressed there was a need to underline that SLOP may be used globally in procedural Oceanic airspace (e.g. across the NAT Region, including Western Atlantic Route System (WATRS), and in the PAC Region) and was not limited to NAT OTS flights. The FAA referred to many operators observed regularly using SLOP in NAT airspace but did not observe corresponding use in the PAC Region. In the same vein, United Kingdom NATS received communication from an airline under the misguided impression that there was no benefit from SLOP for aircraft transiting north or south of the NAT OTS.

Strategic Lateral Offset in Mid-Ocean

3.1.41 The NAT MWG examined the take-up of lateral offsets for aircraft reporting their positions via ADS-C at 30ºW longitude, based on a paper produced by NATS. The latest analysis used a sample of SAATS data from 1 October to 31 December 2008. The analysis of the sample estimated that approximately 35 percent of flights that reported via ADS-C were flying 1 or 2 NM offsets in accordance with SLOP. Current estimates of the proportion of the traffic flying in the NAT Region reporting positions via ADS-C remained around 40 percent. It was noted that much of the recent increasing usage in SLOP was a consequence of certain airlines mandating their crew to fly 1 NM right offsets, which went against the principle of random choice for pilots.

3.1.42 It was found that left offsets constituted a small proportion of the overall data in the sample (less than 1%) but more had been observed in the most recent study than previously seen. NATS had been investigating the details of these occurrences in more detail in order to establish possible reasons for their existence and rising trend. Out of 99 flights classified as being offset to the left of centreline, two days of data contained a third of these events. This suggested that weather may be a factor and it was indeed

operationally acceptable for aircraft to deviate left of centreline in the case of severe and unexpected weather conditions as long as they adopted an altitude modified by 300ft. On inspection of the data for these two days, no hotspots in terms of time or flight level were visible. It also seemed a large coincidence that these flights were often observed exactly 1 or 2 NM to the left of centreline, rather than at intermediate or even larger distances to the left. One other observation was that many of the aircraft types seen using left offsets on these two days were Airbus 330 and Airbus 340, suggesting that the onboard equipment may also have an effect. The remaining data for other days during the 3 month sample had been sent to operators by NATS to engage operators in discussion about what factors may be causing these. Flying left offsets substantially increases the potential for collision.

3.1.43 As in previous years, desensitised graphs of SLOP usage per operator have been distributed by IATA. These data are forwarded directly to airlines and are part of the reason for the increased use of SLOP. The Group agreed the continued data collection, analysis and reporting of SLOP utilization in the NAT Region, as the data suggested that the use of the procedure was still in a state of flux.

SLOP in WATRS

3.1.44 The Group recalled the implementation of the WATRS Route Redesign and Separation Reduction program on 5 June 2008. Currently, the FAA data taken from the Bermuda radar installation was found to not be suitable for determining SLOP use in the WATRS. A technique similar to that used by NATS for discovering mid-ocean SLOP performance and one which the FAA used to assess similar performance in PAC Region airspace could be adapted to show evidence of SLOP in WATRS. Different from the rest of the NAT Region, only thirteen percent of the traffic in WATRS used ADS-C for position reporting. While this could be enough to see SLOP evidence and could be used to detect trends, it would be problematic for using such a small proportion of the traffic to develop a representative estimate for the airspace.

Effect of SLOP on $P_y(0)$

3.1.45 An analysis of the effect of SLOP on the redistribution of probability density and lateral overlap probability $P_y(0)$ showed that for a same direction encounter (the most likely scenario in the NAT OTS) the probability of finding another aircraft vertically displaced was significantly reduced when SLOP was used.

3.1.46 As the proportion of offsets in the most recent sample had risen to a substantial amount it was recognised that would be desirable to produce a separate estimate of $P_y(0)$ to incorporate the benefits of SLOP into the vertical risk estimates. Additionally, SLOP would have an effect on the calculation of longitudinal collision risk. The NAT MWG would review the risk calculation process. With regard to the calculation of the vertical risk, contributions due to same and opposite direction passing would have to be calculated separately, because the effects of SLOP were presented differently in the collision risk equation. Regarding longitudinal risk, only the reduction in the same direction would be considered, as air traffic controllers do not currently assign aircraft to the same route in opposite directions.

Vertical Risk

3.1.47 The NAT MWG determined the vertical occupancy estimates for 2008 based on the traffic weighted average of the United Kingdom 20°W estimates, the Canadian 40°W estimates and the traffic weighted average of both Canadian and United Kingdom 30°W estimates. The estimates were based on SAATS and GAATS data for the 4^{th} and 15^{th} day of each month.

3.1.48 The NAT MWG considered the United Kingdom occupancy results in detail. In particular it was noted that from 2007 to 2008, same direction vertical occupancy estimates for Random flights had

increased whilst a decrease was observed for NAT OTS flights. However, the combined occupancy value has remained similar to the previous year. Canadian data reflect the same trend in vertical occupancies.

3.1.49 In its review of the 2007 reports, NAT SPG requested further elaboration of risk bearing event causes. In response, the NAT SMCG and NAT MWG decided to split the categories D, E, F, G and other further and introduce new categories. New defined categories were introduced to aid in a better understanding of causative factors (a description of the error codes have been included in the NAT SPG Handbook).

3.1.50 It was noted that there were many large differences between 2007 and 2008 Large Height Deviations (LHD) . One of the biggest differences observed in 2007 was the large number of LHDs classified as 1O – "Other". In 2008 data there were only two LHDs which have been classified as 1O, due to the introduction of more categories, such as L4 - "ATC coordination error" to improve understanding of the events contained in 1O. The most commonly observed LHD event category in terms of both number and time spent at wrong flight level in 2008 was 1L4 – "ATC Co-ordination Error". The number of LHDs classified using subcategories had increased from 2007 to 2008.

3.1.51 During 2008 two LHDs had a combined total of 117 minutes at the wrong flight level. The LHD "H/08/1/1" (event category 1L4) spent 53 minutes at the wrong flight level and the LHD "H/08/3/14" (event category 1E) spent 64 minutes at the wrong flight level. These two events accounted for approximately 26% of the time spent at the wrong flight level for all LHDs during 2008.

3.1.52 The Group noted that although the number of LHDs tended to increase year on year and had doubled of the 6 year period presented, the time spent at wrong flight level did not exhibit the same behaviour. Total vertical risk was estimated by summing technical risk and operational risk. In the past, technical risk had been a small proportion of the total vertical risk, and operational risk the larger.

Vertical technical risk estimate

3.1.53 The estimate of vertical technical risk for 2008 was re-estimated at 1.5×10^{-9} fatal accidents per flight hour (fapfh) thus has not changed noticeably since the estimate derived for 2007 (the TLS for vertical technical risk is 2.5×10^{-9} fapfh). This estimate used the Pz(1000) value from NAT SPG/34 and 2008 occupancy estimates. The estimate of vertical technical risk continued to be less than the vertical technical TLS.

3.1.54 The Group agreed the recommendation from NAT MWG regarding the re-estimation of the vertical overlap probability for aircraft flying at the same flight level, $P_z(0)$ and vertical overlap probability for aircraft nominally displaced by 1000 feet, $P_z(1000)$ given the passage of time since the last estimation and also because of experience in the European environment related to RVSM technical risk. The Group invited States to make resources available to conduct this work. Recalling that this matter had been discussed at NAT SPG/44, the NAT MWG recommended that NAT SPG Conclusion 44/24 be re-stated.

NAT SPG Conclusion 45/24 - Estimate of vertical overlap probability

That:

a) the NAT Mathematicians Working Group:

   i) re-estimate vertical overlap probability for aircraft flying at the same flight level, $P_z(0)$ and vertical overlap probability for aircraft nominally displaced by 1000 feet, $P_z(1000)$; and

   ii) report progress to NAT SPG/46 through the Safety Oversight Group; and

b) air navigation service providers assess the availability of the necessary resources to carry out the study identified in a) above.

Vertical operational risk estimate

3.1.55 The operational element of vertical collision risk was determined from two components. The first component was the estimate of time spent by aircraft at uncleared levels or when incorrectly cleared to a flight level (in oceanic airspaces, the time spent at uncleared levels was the primary contributor to the operational risk estimate). The second component was for uncleared level changes, which used the number of levels crossed without clearance or without following published contingency procedures (and the speeds at which the levels had been crossed) during the monitoring year. The LHD data was reported to the NAT CMA and reviewed by the NAT SMCG before being provided to the NAT MWG for analysis.

3.1.56 As with the lateral GNEs, the vertical LHDs reported to the NAT CMA during 2008 were examined in conjunction with the NAT SMCG to agree on the classification for risk estimation purposes. The analysis showed an increase in the time spent at uncleared levels compared and the total number of deviations reported (i.e., the sum of risk-bearing and non-risk-bearing).

3.1.57 The results showed that the Random and combined vertical collision risk due to operational errors for 2008 was estimated above the TLS and the 2008 combined risk had a 25% increase compared to the previous year. The risk estimate for the NAT had now been above the TLS since 2001. Efforts to contain and reduce vertical operational risk were a matter of on-going priority and work was being done in various NAT SPG working groups. As the NAT RVSM airspace was large and complex, the full extent of the measures adopted to address vertical risk was not likely to be seen entirely within one reporting period. Additionally, some of the mitigations required changes to existing procedures and ground-based automated air traffic systems. Since those changes had not been put into place completely as well, it was anticipated that it would require several annual reporting periods before the vertical risk estimate would show the complete consequence of the many activities aimed at reducing vertical risk. The NAT MWG felt that continued concerted efforts by the NAT SPG and its component groups could restore the system performance to levels below the TLS.

3.1.58 The Group noted that NAT MWG had agreed to determine whether vertical occupancy estimates could be easily prepared at a more frequent interval – so that a quarterly rolling estimate of occupancy might be prepared. This action would aid the advancement of system safety management that, through the NAT CMA, might allow facility managers, decision makers to better see the effects of measures taken that are directly related to the factors that affect risk and in particular, monitor the occupancy of aircraft adopting Random routes (NAT SPG Conclusion 44/18 refers).

Review of On-Going Monitoring Procedures - Vertical Monitoring Pack

3.1.59 The Group was informed about the review of the 'vertical monitoring pack', which was a collection of tables and graphs used for assessing the combined altimetry system error (ASE) performance of the aircraft sample captured. The review was produced with the intent of providing quality assurance data relevant to individual aircraft, aircraft groups and operators. The source of the data used for generation of the pack was the NAT CMA's HMU and Global Positioning System (GPS)-Based Monitoring Unit (GMU) ASE measurements. The global guidance material contained ASE performance specifications and the pack was used to ensure that individual aircraft, aircraft groups and operators continue to meet those specifications.

3.1.60 All apparently non-compliant height measurements (those of 300ft or more) had been scrutinised and appropriate action had been taken by the NAT CMA within two weeks of verifying the result. In was noted that there were no validated non-compliant measurements during 2008. Airframes with

consistently poor performance (e.g. having a high proportion of aberrant height measurements, or having a deteriorating trend) were flagged up to the NAT CMA.

NAT MNPS Risk Quick Reference Guide

3.1.61 The Group was also informed that NAT MWG reviewed the latest version of the NAT MNPS Risk Quick Reference Guide to the Group. The guide summarised details of the collision risk models and associated parameter values, including yearly summaries of operational errors. Suggestions received had been used to update the guide (the Quick Reference Guide was freely available to any interested NAT groups or individuals).

MWG Work Programme

3.1.62 The Group noted that the next annual risk assessment would be performed by May 2010 for timely report to NAT SPG/46. The Group noted the NAT MWG work programme would be presented at the first meeting of the NAT SOG.

3.1.63 When examining issues related to determining the level of risk, it was proposed that the NAT MWG undertake an analysis to determine the effect that the use of SLOP would have on the vertical risk. The Group felt that this type of information could be of great assistance when encouraging operators to fully implement SLOP for all NAT operations. The Group also supported the proposal that the NAT MWG should continue to develop ways and means to update the vertical risk more frequently; if possible, on a monthly basis. The last issue to be examined was a proposal for the NAT MWG to provide a geographical breakdown of the occurrences of LHDs and the associated effects that these LHDs might have on the vertical risk.

3.1.64 The Group was not in a position to obtain clear guidance on how to address these three issues could be dealt with and therefore could not provide direction to the NAT MWG. However, considering the establishment of the NAT SOG (paragraph 1.3.28 refers) and its task to review the structure and work programmes of its working groups, including the work programme of the NAT MWG, the Group noted that the Secretary would ensure that these issues were brought to the attention of the NAT SOG for their consideration and action, if required. The NAT SPG would be provided with an update by the Secretariat.

OTHER SAFETY RELATED MATTERS

Plan for the implementation of AIDC in the NAT Region

3.1.65 NAT SPG/44 noted that a significant proportion of the LHD reported by the NAT SMCG had involved coordination errors (paragraph 3.1.18 refers). It had been recognised that the use of AIDC could enhance safety by eliminating or reducing the potential for co-ordination errors as well as improving the efficiency of the ATS units by facilitating the co-ordinating process. Considering the significant safety benefits that could be derived from an expanded use of AIDC, the NAT SPG had agreed that its implementation in the entire NAT Region be given a high priority and that an implementation plan should be drafted.

3.1.66 To follow up on NAT SPG Conclusion 44/1, the NAT IMG had established a Task Force to determine ways and means to begin developing an AIDC implementation plan. The Task Force had prepared a list of all the AIDC links that would need to be implemented to fulfil the requirements of NAT SPG Conclusion 44/1. In addition, an AIDC improvement plan had been developed to complement the matrix of links. These two documents plus the experience gained by Portugal and the United States when they implemented full AIDC between Santa Maria and New York ACCs would serve as the basis to develop a detailed implementation plan.

3.1.67 In addition, the NAT IMG had set a completion date for the full implementation of AIDC throughout the NAT Region, including the re-negotiation functionality. Bearing in mind the applicability date of 15 November 2012 for Amendment 1 to the 15th Edition of the PANS-ATM (Doc 4444) and the need to change FDPS to accommodate that change, the agreed that the same date be used for the mandatory implementation of AIDC throughout the NAT Region. This would not preclude gradual improvement/implementation of AIDC links prior to 2012.

3.1.68 The Group was informed that the NAT Common Coordination Interface Control Document (NAT-CC ICD), which was an integral part of the AIDC implementation plan, had been updated to take account of recent changes, including new messages that had been agreed for use in the APAC Region. The document was in the final stages of being revised and a new edition would be published in August 2009.

3.1.69 The Group was informed that both the NAT and APAC Regions had identified the safety benefits of accelerating AIDC implementation in order to reduce ATC to ATC coordination errors. As indicated in paragraph 3.1.65 above, efficiency had been the original driver for implementing AIDC but all Regions had stated that the safety benefit to be obtained were significant. These benefits would be compounded if all regions that used AIDC used the same basic ICD, particularly for those States that interface with different planning Regions. Because both planning areas (APAC and NAT) had created AIDC ICDs which utilized the same messages as defined in the PANS-ATM 5Doc 4444), it would be possible to combine the ICDs to have a harmonised multi-national ICD. The Group agreed with this initiative and noted that the following three areas would need to be addressed:

a) there would be a need to consolidate the NAT and the APAC ICDs (the two were already very similar);

b) it would be necessary to agree on a maintenance mechanism. The NAT IMG felt that this should initially be under the aegis of the NAT SPG and APAC Air Navigation Planning and Implementation Regional Group (APANPIRG) with an appropriate change control mechanism to support the document; and

c) whilst recognizing the value of the PANS-ATM (Doc 4444) message set, it may be necessary to expand it based on the experience gained from full implementation of AIDC in the regions concerned.

3.1.70 During the discussions, the Group was informed that coordination was taking place with various groups in the A PAC Region to develop a similar policy regarding the need for a harmonised multi-national ICD. It was anticipated that a recommendation would be made at the next APANPIRG meeting.

3.1.71 The Group agreed that, since the impetus for the implementation of AIDC was safety related, the NAT SOG should start monitoring the effects that the gradual improvements/implementation of AIDC links may have on reducing the number of coordination errors and therefore the risk. If it was determined that the implementation of AIDC was having a significant risk mitigation effect, it might be necessary to revaluate the implementation schedule if possible.

3.1.72 The representative for Norway informed the Group that Norway fully supported the implementation of AIDC by November 2012 but that they may not be able to meet the target date because it had to implement several major software changes to meet other commitments. This matter would need to be prioritised within the ANSP work plan.

NAT SPG Conclusion 45/25 - Implementation of Air Traffic Services (ATS) Inter-Facility Data Communication (AIDC) throughout the NAT Region

That:

a) all States make arrangements to fully implement AIDC, including the re-negotiation function, by 15 November 2012;

b) the NAT Implementation Management Group (NAT IMG) oversee the development of a detailed implementation plans to assist Air Navigation Service Providers (ANSP) to meet the 15 November 2012 date;

c) the NAT IMG direct its contributory groups to assist in the development of a harmonised multi-regional AIDC Interface Control Document (ICD);

d) the NAT Safety Oversight Group keep under review the impact that the gradual implementation of AIDC may have on reducing risk; and

e) the NAT SPG be provided with regular progress reports.

Proposal for amendment to the NAT regional supplementary procedures (SUPPs) (Doc 7030) regarding the use of strategic lateral offset procedures (SLOP)

3.1.73 In follow up to NAT SPG Conclusion 43/23 e), the NAT IMG had initiated work to develop a proposal for amendment to the NAT SUPPs (Doc 7030) to capture the NAT regional requirements for the use of SLOP. The Group recalled that this activity had been undertaken as part of a concerted effort to raise the awareness of the importance of applying the SLOP in order to reduce risk.

3.1.74 Amendment 4 to the 14th Edition of the PANS-ATM (Doc 4444) had generated a consequential amendment to the NAT SUPPs (Doc 7030) that removed the provisions relating to the application of SLOP in the NAT Region. After examining the changes, the Group agreed that the requirement for the application of SLOP in the NAT Region was required as part of the efforts to reduce risk and that this requirement should be included in the NAT SUPPs (Doc 7030). In addition, the Group agreed that there were two provisions that were specific to the NAT Region which had not been included in the global provisions, namely where to establish the offset and what should be done when entering radar coverage. It was stressed that these procedures were not included in the PANS-ATM (Doc 4444) and any proposal to add them to the NAT SUPPs (Doc 7030) would compliment or supplement the PANS-ATM (Doc 4444) provisions and in no way contradict them.

3.1.75 In addition to the foregoing, the Group noted that paragraph 15.2.4.1.2 of the PANS-ATM specified that aircraft may offset 1 or 2 NM to the right of the centre line. However, it had been recognised from experience that most aircraft operating in the NAT Region flew the centre line thus negating the risk reducing potential that the full use of the offsets would have. It was therefore agreed that the NAT Region adopt a position on the use of SLOP that would be in line with the intent of the PANS-ATM. Accordingly, it was agreed that provisions should be inserted in the NAT SUPPs to encourage flight crews capable of flying a strategic lateral offset to do so. The Group endorsed the draft proposal for amendment shown in **Appendix J** and noted that Iceland would present it on behalf of the NAT SPG.

3.1.76 The meeting expressed a strong desire for SLOP to be applied in NAT at all times. However, it was recognized that according to current provisions of Annex 2 and PANS-ATM, the compulsory application of SLOP would not be possible. In this regard, the Group was presented with a proposal to choose between “should fly” and “should consider flying”. Following an in-depth discussion, it was agreed that the text of the proposed amendment to Doc 7030 pertaining to the application of SLOP should read “are strongly encouraged to fly”.

NAT SPG Conclusion 45/26 - Amendment to the NAT Regional Supplementary Procedures (SUPPs)

That the Representative of Iceland, on behalf of the NAT SPG, make arrangements within his/her administration to process the proposal for amendment to the NAT SUPPs regarding the application of Strategic Lateral Offset Procedures (SLOP) in the NAT Region as shown in **Appendix J** to this report.

Safety management activities

3.1.77 As part of its regular work programme, the NAT IMG reviewed safety management issues that were brought to its attention by its working groups or other sources. It had taken action itself or adjusted the work programmes of its working groups accordingly. In the course of this activity, the NAT IMG was informed that many of the safety concerns that had been identified seemed to stem from non-adherence or incorrect execution of oceanic clearances (paragraph 3.1.19 refers). The NAT IMG therefore undertook to review the NAT Region operating concept with a view to determining whether it remained necessary to use oceanic clearances. In doing so, a full review of the oceanic clearance process would also be carried out which would include a determination of elements that may contribute to GNE or LHD and to develop appropriate mitigation. The Group noted that, if the results of the review indicated that changes to the current operating methods would be required, the NAT SPG would be informed and requested to provide direction.

3.2 OPERATIONAL ISSUES

Report of the NAT Aeronautical Communications Group

3.2.1 The Group was presented with the report of the NAT ACG. The Group noted that as part of the changes made to the NAT SPG working structure, the NAT ACG would, in future, report through the NAT IMG.

3.2.2 The Group noted that there were no major problems affecting current network operations. Minor issues continued to be resolved by coordination between the watch managers on a daily basis. The tactical teleconferences between Gander, Iceland and Shanwick Radio Station Supervisors were working well and will be extended to include Supervisors from Bodø, New York and Santa Maria Radio Stations.

3.2.3 The Group was presented with the executive summary of the NAT ACG Consolidation Report that contained an analysis of the 2008 network message volume and distribution. The Group noted that the total amount of HF and General Purpose (GP) VHF contacts for all Aeronautical Stations for the year 2008 was 3.774.971 messages, which was an increase of 2% over 2007, distributed as follows:

a) 73.63 % by HF;

b) 26.23 % by VHF frequencies;

c) 0.14 % on SATCOM voice; and

d) the relative percentage of traffic for each Aeronautical Station was Gander (31%), Shanwick (29%), Iceland (16%), Portugal (12%), United States (11%) and Norway (1%).

3.2.4 The Group was informed that the analysis of so called “nuisance reports” generated by data link equipped aircraft had been conducted by Canada and Ireland. The analysis demonstrated that these reports constituted a significant portion of the total message traffic (about 10%). The Group noted that the analysis would be reviewed by the NAT IMG in order to determine ways and means to reduce this contributory factor to the voice network workload. The NAT IMG would also determine if the analysis was required to be performed on a yearly basis and whether there were changes needed to the format of the analysis.

3.2.5 The Group was presented with an action plan that was developed by the NAT ACG to address NAT SPG Conclusion 44/34. The Group recalled that this conclusion had tasked the NAT ACG to evaluate the need and ability to increase the number of HF frequencies available for use in the NAT Region and to develop an implementation plan that would take account of the need to amend ICAO documents and the effects on human resources.

3.2.6 The action plan included the following steps:

a) Carry out radio monitoring of selected HF channels according to the agreed scheme by NAT aero radio stations and determine a list of unoccupied frequencies. Responsible – NAT aero radio stations.

b) ICAO EUR/NAT to coordinate with ICAO HQ and other regional offices the list of unoccupied frequencies in order to detect possible users. States to approach national radio regulatory authorities to verify whether there is information available on the actual usage of the selected frequencies.

c) Request International Telecommunication Union (ITU) to amend Appendix 27 to include additionally proposed HF frequencies. Responsible – States/ICAO.

d) Draft proposal for amendment to Doc 7030 to include the new HF frequencies. Responsible – ACG

e) Amend Aeronautical Information Publications (AIP). Responsible – States

f) Plan to commence operations by the end of 2010. Responsible – States.

g) Draft an implementation plan to enable a centralized HF management and coordination mechanism. Responsible – ACG.

3.2.7 The Group noted that action a) was already in process. In regard to action g), the Group noted that a centralized HF frequency management and coordination mechanism was seen as a useful tool to ensure more efficient use of the frequency spectrum. The Group noted that implementing such a mechanism required some preparatory work to be done. Nevertheless, it was worthwhile to include this action as a future development. The Group agreed in principle to the proposed action plan.

NAT SPG Conclusion 45/27 - Plan for Future HF Network Operations

That the NAT Implementation Management Group (NAT IMG):

a) Review, determine the timeline and ensure implementation of the following action plan in order to increase the number of high frequency (HF) frequencies available for the NAT Region:

   i) carry out radio monitoring of selected HF channels according to the agreed scheme by NAT aero radio stations and determine a list of unoccupied frequencies. Responsible – NAT aero radio stations;

   ii) EUR/NAT Office of ICAO to coordinate with ICAO Headquarters and other regional offices the list of unoccupied frequencies in order to detect possible users. States to approach national radio regulatory authorities to verify whether there is information available on the actual usage of the selected frequencies.

   iii) request International Telecommunication Union to amend Appendix 27 to include additionally proposed HF frequencies. Responsible – States/ICAO;

   iv) draft a proposal for amendment to Doc 7030 to include the new HF frequencies. Responsible – NAT IMG;

   v) amend Aeronautical Information Publications. Responsible – States;

vi) plan to commence operations by the end of 2010. Responsible – States; and

vii) draft an implementation plan to enable a centralized HF management and coordination mechanism. Responsible – NAT IMG; and

b) Provide a progress report to NAT SPG/46.

3.2.8 The Group noted that the NAT ACG was prepared to provide assistance in conducting some studies identified by the NAT Communications Strategy, such as a study on technical ramifications of any reduction of SELCAL checks.

3.2.9 The Group noted the NAT ACG arguments in regard to the benefits of implementing some of the actions of the NAT Communications Strategy. For example, a proposal to reduce/eliminate mid-ocean SELCAL checks and HF frequencies uplink, would, from the NAT ACG point of view, introduce more problems to the operational environment than any substantial reduction in the volume of voice messages. Integrity of the voice network operations, reduction in the flexibility of aircraft distribution amongst available frequencies and extra workload were examples of such problems.

3.2.10 The Group noted that HF voice resource congestion existed only during periods of traffic peaks and associated increases in HF voice traffic. Outside these peak periods, the number of HF messages being received was not posing any difficulties. This issue could be solved by increasing the number of frequencies available at the ground stations during those peak periods.

3.2.11 The Group pointed out that the working methods of the NAT ACG (future NAT Aeronautical Communications Study Group (NAT ACSG); paragraph 1.3.12 refers) would need to be slightly adjusted to meet the objectives of a performance driven air navigation system. The Group expected that the NAT ACSG would provide more insight and be more proactive regarding the future trends of aeronautical communications in general and HF in particular. The Group also anticipated that more performance oriented analysis material would be produced by the NAT ACSG to assist in decision making about the future of the NAT region's voice communications system.

3.2.12 Finally, the Group reiterated that the future evolution of the NAT region's voice communications system would be part of the NAT Communications Strategy that would be incorporated into the NAT Service Development Roadmap and recalled that the NAT IMG had tasked its contributory groups to address the actions included in the NAT Communications Strategy. The Group noted the intention of IATA and IFALPA to contribute to these actions through appropriate channels within the NAT IMG.

Report of the North Atlantic Operations Managers Group

3.2.13 The Group noted that the 37th meeting of the NAT OPS MNG had been held in Reykjavik, Iceland from 16 to 18 September 2008. The Group recalled its decision that the NAT OPS MNG would be disbanded as formal working group under the NAT SPG working structure but noted that this was in no way intended to hinder inter-facility coordination and cooperation on operational issues. The Group noted that, when considered necessary, issues would be coordinated directly between ATSU and the NAT IMG working structure (paragraph 1.3.11 refers).

OTHER ISSUES

Use of SATCOM Voice for routine air traffic services communications

3.2.14 The Group was presented with a proposal for amendment to the NAT SUPPs (Doc 7030) to remove the existing provision that limited the use of SATCOM voice to emergency and non-routine ATS communications. The Group noted that this proposal was developed to address NAT SPG Conclusion 44/13.

3.2.15 The Group recalled that the development of required procedures and documentation would include publication of AIP amendments and/or Aeronautical Information Circulars (AIC) and an amendment to Regional SUPPs (Doc 7030). Procedures and documentation were available as a result of the SATCOM Voice Task Force (SVTF) and had been made available to all concerned as guidance material and published at the following URL:

http://www.paris.icao.int/documents_open/subcategory.php?id=106.

3.2.16 The publication of AIP amendment(s) or AIC(s) would depend on whether or not an ANSP offered the service. The only outstanding issue that needed to be addressed to complete work on NAT SPG Conclusion 44/13 was an amendment to the NAT SUPPs (Doc 7030).

3.2.17 The Group was advised that the current proposal had been coordinated with the ICAO APAC Region to ensure commonality as they planned to implement SATCOM voice for all ATS communications in the second half of 2009. ICAO Headquarters was also involved in this process. Its coordination was also being carried out with Canada and the United States via their participation in NAT IMG working groups. The Group noted that the material developed could be used as the basis for future global provisions. It was anticipated that when such provisions have been adopted/approved, the NAT SUPPs (Doc 7030) would be updated accordingly.

NAT SPG Conclusion 45/28 - Amendment to the NAT Regional Supplementary Procedures (SUPPs) regarding the use of SATCOM voice for Air Traffic Services (ATS) communications

That the Representatives of Canada and the United Kingdom, on behalf of the NAT SPG, make arrangements within their administrations to process the proposal for amendment, as shown in **Appendix K** to this report**,** to the NAT SUPPs regarding the use of SATCOM voice for ATS communications in the NAT Region.

3.2.18 The Group emphasised that the proposed implementation of SATCOM voice for all communications was not meant to detract from the use of the CPDLC for communications. Priority should always be given to the use of CPDLC by appropriately equipped aircraft. The Group noted that paragraph 3.4.2 of the proposal contained an additional clarification related to the use of SELCAL and recalled that the issue of SELCAL use would be reviewed as part of the NAT Communications Strategy. Until these studies were completed the paragraph would need to remain. Finally, the Group noted that the appropriate provisions of the NAT ANP would also need to be amended to remove the existing limitation of SATCOM voice to non-routine and emergency ATS communications.

Preliminary report of the first EUR/NAT Volcanic Ash Exercises Steering Group (VOLCEX SG)

3.2.19 In follow up to NAT SPG Conclusion 44/17, the EUR/NAT VOLCEX SG carried out the first VOLCEX exercise from 9 to 25 March 2009 in Iceland with participation from the Volcanic Ash Advisory Centres (VAAC) London and Toulouse, the Iceland MET Office, ISAVIA (Iceland Air Navigation Service Provider (ANSP)) and AVINOR (Norway ANSP). The VOLCEX used a simulated ashplume from Iceland due east into Norway, Sweden, Finland and North-West Russia. SIGMETs were issued by Sweden and Russia but no response was received from Finland.

3.2.20 The exercise was debriefed during the Volcanic Ash Awareness Workshop held in Catania, Italy on 26 June 2009. The final report would be made available thereafter. In the meantime, several internal and external lessons were learned from the exercise. The major issue was, as in previous exercises, the need for a single message, preferably a graphic one, covering the whole volcanic ash cloud to be used by all the Meteorological Watch Offices (MWO), ATC units and Aircraft Operations (AO) bases to plan their work.

3.2.21 The existing system using FIR based SIGMETs and NOTAM over the Aeronautical Fixed Telecommunication Network (AFTN) was inefficient when dealing with high speed jetstreams and high latitudes. AFTN message processing was based on using as few polygons as possible both, in production and plotting. Just a few polygons can however cause significant distortions in positions of plotted areas at high altitudes when different chart projections are used.

3.2.22 In parallel with the VOLCEX, a Volcanic Search and Rescue (SAR) (VOLCSAR) exercise was carried out on 13 May 2009. The debriefing will take place in Copenhagen from 21 to 24 September 2009. ISAVIA proposed an exercise scenario where Volcanic Ash was the cause of the causality scenario which hampered the Search and Rescue operations. The objective of raising awareness amongst SAR personnel how volcanic ash could hamper SAR operation was accomplished and the crews expressed the opinion that such exercises should be held frequently. An early indication was that it may not be possible to use airborne assets in SAR operations related to volcanic ash activity because of the increased risk to the aircraft involved. This would require further evaluation.

3.2.23 The Group expressed its appreciation for the information and noted that representatives from Shanwick Oceanic Area Control Center (OAC) wished to participate in the work of the VOLCEX. The Representative of Iceland would carry out the necessary coordination with the Icelandic co-chairman of the VOLCEX. The Group also noted that the NAT IMG intended to monitor developments to determine if its work programme would need to be modified.

4. SUPPORT SERVICES

4.1 NAT DOCUMENT MANAGEMENT OFFICE (DMO)

Updates to the NAT regional documentation

NAT Minimum Navigation Performance Specifications (MNPS) Airspace Operations Manual

4.1.1 The Group was informed that, in follow up to NAT SPG Conclusion 44/38, the NAT MNPS Airspace Operations Manual - Edition 2008 had been published electronically at the end of August 2008. The document could be downloaded from the following URL: **http://www.nat-pco.org/mnpsa.htm**. The document would be updated annually, normally after the NAT SPG meeting. Nevertheless, if a change that affected safety was identified, consideration would be given to publishing an amendment as soon as possible.

4.1.2 In follow up to the work carried out since September 2008, it was determined that the NAT MNPS Airspace Operations Manual should be amended to take account of the concerns that had been expressed by IFALPA regarding the implementation of 5 minute longitudinal separation using GNSS. In addition, the discontinuity that existed between the provisions in the PANS-ATM (Doc 4444) and the contents of the Manual regarding contingency procedures should be reviewed and the Manual updated to take account of Amendment 2 to the PANS ATM (Doc 4444). Necessary further amendments to the NAT MNPS Airspace Operations Manual text would be effected post November 2009 to take account of Amendment 2.

4.1.3 In addition to the foregoing, the Editor had identified several issues relating to the efficacy of a number of operational issues and how they are, or whether they should be, reflected in the NAT MNPS Airspace Operations Manual. The debates of surrounding such issues were still on-going and amendments or additions have not yet been agreed. These matters include:

a) Simplified Navigation Check Procedures;

b) SLOP Offset Choice Strategy;

c) Lost Communication Procedures

d) Mass Turnback Procedures and

e) Contingency Route Listings.

4.1.4 To date three subjects had arisen which required an amendment to the Manual. The Group agreed with the proposed changes as shown in **Appendix L.**

4.1.5 Considering the agreement to implement SATCOM voice for routine ATS (paragraph 3.2.17 refers), the Group agreed that it was opportune to begin developing material for inclusion in the NAT MNPS Airspace Operations Manual as soon as the proposal for amendment has been approved and a common implementation date agreed. This amendment, as well as the others that stemmed from NAT SPG/45, would be included in the Manual at the earliest opportunity.

NAT SPG Conclusion 45/29 - Amendment to the NAT Minimum Navigation Performance Specifications (MNPS) Airspace Operations Manual

That the NAT Documentation Management Office (DMO):

a) continue to manage the NAT MNPS Airspace Operations Manual;

b) in coordination with the ICAO Secretariat, prepare an amendment to the NAT MNPS Airspace Operations Manual taking account of the decisions of NAT SPG/45, changes to the NAT Air Navigation System since September 2008 and the material shown in **Appendix L** to this report; and

c) arrange to publish electronically the NAT MNPS Airspace Operations Manual – Edition 2009 – in September 2009.

Guidance Material concerning Air Navigation in the North Atlantic Region (NAT Doc 001)

4.1.6 The Group recalled that the existing 7th Edition of NAT Doc 001 had been published in 2002 and that it had not been updated in line with Edition 2008 of the NAT MNPS Airspace Operations Manual. The NAT DMO therefore proposed that a complete overhaul of NAT Doc 001 was required.

4.1.7 The Foreword of NAT Doc 001 states that: "*this document deals primarily with approval for operations in the NAT Region and with the planning and* management *of such operations"* and is "*addressed mainly to State aviation authorities/administrations and to Air Traffic Services (ATS) Provider States and Operators*." The requirement for the publication of such material was identified by the 1976 Limited NAT Regional Air Navigation (RAN) Meeting. The contents covered the MNPS concept, issues pertinent to International General Aviation operations at lower levels and procedures dealing with airspace reservations.

4.1.8 Despite the originally intended all-encompassing target readership and the comprehensive scope of the subject matter, the NAT SPG had recognised that particular parties required specific and more detailed guidance. As a consequence the first edition of the NAT MNPS Airspace Operations Manual, aimed at pilots and dispatchers, was published in 1979. The "General Aviation Manual" soon followed. The similar needs of other interested parties were also subsequently addressed and further NAT Region specific documentation has resulted, including "HF Guidance Material", "The Application of Separation Minima (ASM) document", "Flight Planning Guidance material", "The Guidance Material for ATS Data Link Services in North Atlantic Airspace", and "The Sample Oceanic Check List".

4.1.9 The Group was informed that the intended readerships of all documents was wide-spread and included NAT ANSPs, commercial airspace users, business aviation, general aviation and military. Interested personnel included pilots, dispatchers, fleet managers and training units. Some of this guidance material was also addressed to both the ANSPs and CSPs. In each instance State safety regulators were guided by this documentation and training institutions used the material when developing their curricula.

4.1.10 It was recalled that NAT airspace users have often promoted the concept of "one-stop-shopping" for necessary procedural information. However, different classes of interested parties have very different "shopping-lists" and it was clearly not appropriate to include all the necessary NAT Region specific guidance in one massive tome. The existing NAT Doc 001 does come close to a single document covering most NAT specific issues. However, the level of detail afforded each issue in this document varied widely and in many cases there was a significant overlap with other available specialist documentation.

4.1.11 The NAT DMO's initial review of NAT Doc 001 suggested that there was a need to consider the available NAT material in its entirety, with a view to eliminating contradictions and as far as possible duplication; make more use of cross-referencing; and concentrate the orientation of individual documents towards particular target readerships. Also, future maintenance of the NAT Doc 001 should be facilitated and the concept of "one-stop-shopping" might be better addressed. The Group supported the NAT DMO proposal and therefore agreed that the NAT DMO be tasked with drafting a new electronic edition of NAT Doc 001. The draft should be presented to NAT SPG/46 for endorsement. Furthermore, it was suggested that the NAT DMO should develop a proposal on how to rationalise all other NAT Region documentation to facilitate "one-stop-shopping" and document maintenance.

4.1.12 During the discussions, it was recalled that the work of the NAT DMO was managed by the EUR/NAT Office of ICAO which depended on outside financing. The Group noted that the update to NAT Doc 001 might require additional resources to cover the costs that might be incurred to carry out some of the work from the EUR/NAT Office.

NAT SPG Conclusion 45/30 - Amendment to the Guidance Material concerning Air Navigation in the North Atlantic Region (NAT Doc 001)

That the NAT Documentation Management Office (NAT DMO):

a) develop a draft electronic edition of the Guidance Material concerning Air Navigation in the North Atlantic Region (NAT Doc 001);

b) prepare a proposal on how to rationalise all remaining NAT Region documentation; and

c) present the results of its work to NAT SPG/46 for endorsement.

4.1.13 In concluding its review, the Group expressed its appreciation to Mr Alan Gilbert who was editing the NAT documents on behalf of the NAT SPG.

4.2 NAT SPG HANDBOOK

4.2.1 The Group was informed that the NAT SPG Handbook would be updated to reflect the decisions that had been agreed to in the course of the meeting. The presentation of the Handbook would be slightly modified to reflect the change in emphasis to a performance based system and the NAT Safety Policy would appear at the beginning so that would overarch the whole document. The final version of the Handbook would be made available on 15 July 2009.

5. ANY OTHER BUSINESS

5.1 NAT SPG FOLLOW UP

5.1.1 The Group reviewed the status of the Conclusions reached by NAT SPG/44 and noted that a detailed description of actions taken to address the conclusions would be distributed in the near future.

5.2 NEXT MEETING

5.2.1 The Group agreed to convene its Forty-sixth Meeting in the EUR/NAT Office of ICAO in Paris from 22 to 25 June 2010.

5.3 FAREWELLS

5.3.1 The Group bid farewell to Mr André Berman, the outgoing Representative of France, who would be retiring at the end of August 2009. André had been working with the NAT SPG since 1992. His Gaulois persona would be missed and the Group wished André and his family all the best in their future endeavours.

5.4 REMEMBRANCE

5.4.1 The Group was informed that Mr Gudmundur Mattiasson had died on 4 April 2009. It was recalled that Gudmundur had begun his participation in the work of the NAT SPG in 1978 and that he became the Representative of Iceland in 1981. He served as the Vice-Chairman until 1987 when he was appointed Chairman, a post he fulfilled until 1992, when Gudmundur was appointed to the ICAO Council as the Representative of Iceland. The Group requested the Chairman to pass on its condolences to Gudmundur's family.

5.5 RETIREMENT OF REGIONAL OFFICER ATM JACQUES VANIER

5.5.1 A fond farewell was bid to Mr Jacques Vanier, who would retire from the post of EUR/NAT Regional ATM Officer as of 1st of October 2009. Jacques had been well known to the NAT SPG family for many years. His contribution to the preparation of NAT SPG meetings and his expert advice during those meetings was very much appreciated.

APPENDIX A – LIST OF PARTICIPANTS

(Paragraph 0.3 refers)

CANADA *
Larry LACHANCE

DENMARK *
Knud ROSING
Kurt ANDREASEN

FRANCE *
André BERMAN
Christian QUÉNET

ICELAND *
Asgeir PALSSON#
Hlin HOLM
Leifur HAKONARSON

IRELAND *
Donie MOONEY

NORWAY *
Per Harald PEDERSEN
Gitte VIKSAAS

PORTUGAL *
Carlos ALVES
José CABRAL

SPAIN
José Maria CURA OCAÑA

UNITED KINGDOM *
Matthew TEMPLE-SMITH
Finlay SMITH

UNITED STATES *
Anthony FERRANTE
David MAYNARD
Daniel VACA

IATA
Peter CERDA

IBAC
Brian BOWERS

IFALPA
Mark SEAL

IFATCA
Edward WALLACE

NAT CMA
David NICHOLAS

* NAT SPG Member

\# Chairman

APPENDIX B- SAFETY POLICY STATEMENT

(Paragraphs 1.3.7 refers)

Safety is one of NAT SPG 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.

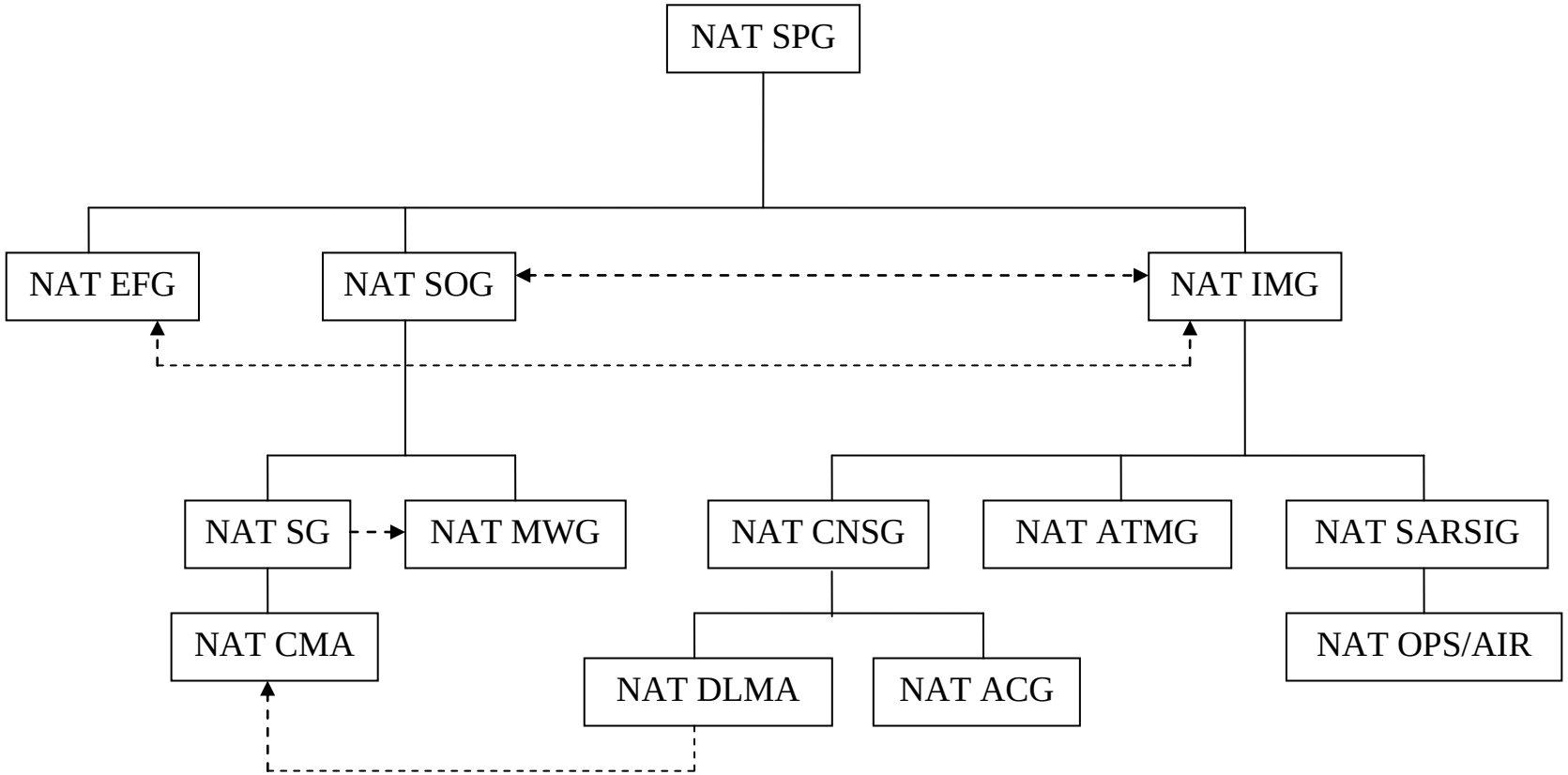
Guiding Principles

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

APPENDIX C - NAT SPG ORGANIZATIONAL DIAGRAM

(Paragraphs 1.3.10, 1.3.12 and 1.3.13 refer)



APPENDIX D - PROPOSED TERMS OF REFERENCE FOR THE NAT IMG AND ITS CONTRIBUTORY GROUPS

(Paragraphs 1.3.17 and 1.3.25 refer)

NAT IMPLEMENTATION MANAGEMENT GROUP (NAT IMG)

Terms of Reference

The NAT IMG was established by a Meeting of North Atlantic High Level Managers, held in Paris 20-21 January 1994 and NAT SPG/30 decided on its initial terms of reference. Its current terms of reference are:

1. Support the objective of, and abide by the guiding principles of, the NAT SPG Safety Policy whilst carrying out its own activities and directing the activities of its implementation working groups.
2. Develop and manage the NAT Services Development Roadmap, which identifies priorities and sets out timetables with associated milestones.
3. Identify, detail and recommend allocation of tasks and resources required to fulfil the NAT Implementation Plan.
4. Assess the cost-effectiveness of the elements of the NAT Implementation Plan.
5. Approve or amend the terms of reference of NAT implementation working groups and to direct their work programmes.
6. Ensure the necessary co-ordination and/or consultation with NAT Provider States, other States, NAT Users and appropriate International Organizations.
7. Propose to the NAT SPG amendments to the Air Navigation Plan, the Facilities and Services Implementation Document and the Nat Implementation Strategy.
8. Seek guidance from the NAT SPG on issues that the Group cannot resolve.
9. Report 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 IACA, IATA and IBAC.

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.

APPENDIX E - PROPOSED TERMS OF REFERENCE FOR THE NAT IMG CONTRIBUTORY GROUPS

(Paragraphs 1.3.17 and 1.3.25 refer)

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.

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.

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.

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.

NAT AIR TRAFFIC MANAGEMENT GROUP (NAT ATMG)

Terms of Reference

The NAT ATMG seeks approval from the NAT IMG for proposed changes to the NAT Region air navigation documentation in accordance with the following terms of reference:

1. Identify and propose remedial action for shortcomings and deficiencies.
2. Develop procedures to support the implementation of planned CNS/ATM initiatives.
3. Develop procedures for the application of agreed reductions in separation minima in the NAT Region.
4. Keep under review the Application of Separation Minima (North Atlantic Region) document and address outstanding issues.
5. Keep under review detailed operational requirements for Air Traffic Services (ATS) Inter-Facility Data Communication (AIDC) messages in support of Air Traffic Management (ATM).
6. Take into account, and develop as required, NAT Region requirements for Air Traffic Flow Management (ATFM) in harmonisation with Air Traffic Flow Management (ATFM) developments in the Caribbean (CAR), EUR and North America (NAM) Regions.
7. Take into account, and develop as required, NAT Region requirements for civil/military coordination
8. Establish the requirements for harmonisation of Flight Data Processing Systems (FDPS) within the NAT Region.
9. Determine the future operational requirements for Airspace Management (ASM) in the NAT Region.
10. In close cooperation with the NAT CNSG, determine the ATM procedures for the implementation of Communications, Navigation and Surveillance (CNS) in the NAT Region.
11. Co-ordinate the development of contingency plans
12. Address other issues as directed by the NAT IMG.

Composition

The NAT ATMG is composed of representatives from NAT SPG member States as well as participants from Spain, IATA, IBAC and IFALPA.

The Group may invite participants from other States, organisations or industry as required.

NAT SAFETY ANALYSIS AND REDUCED SEPARATION IMPLEMENTATION GROUP (NAT SARSIG)

Terms of Reference

The NAT SARSIG makes recommendations regarding changes to separation minima, procedures, safety compliance monitoring requirements, the implementation of new technologies and the safety assessments necessary to sustain changes to the NAT Region air navigation system, as assigned by the NAT IMG. It has the following terms of reference:

1. Develop a work programme for those tasks assigned to the group by the NAT IMG.
2. Develop material for elaboration of safety cases to be used for the proposed reductions or changes in application of separation minima or regional implementation of new technologies.
3. Ensure that collision risk assessments, including functional hazard and risk analysis, are carried out and if required, identify necessary mitigations for reductions or changes in application of separation standards or regional implementation of new technologies.
4. Ensure that an appropriate Target Level of Safety (TLS) is adopted for use in evaluating reductions of separation minima or changes in application of separation standards.
5. Identify those elements which are critical in the assessment of collision risk and suggest areas where safety improvements would be effective in reducing risk.
6. Assess the effects that projected increases in traffic would have on risk.
7. Ensure that Collision Risk Models (CRM), when used in the NAT Region, are appropriate.
8. As part of a safety case, determine the Communications Navigation and Surveillance (CNS) elements necessary to progressively reduce horizontal separation.
9. Study the aircraft operational issues related to the implementation of RNP in the NAT Region.
10. Address other issues as directed by the NAT IMG.
11. Report to the NAT IMG.

Composition

The NAT SARSIG is composed of representatives from NAT SPG member States as well as participants from IATA and IFALPA.

The Group may invite participants from other States, organisations or industry as required.

OPERATIONS AND AIRWORTHINESS SUB-GROUP (OPS/AIR)

Terms of Reference

The OPS/AIR sub-group serves as a forum for State and aviation industry specialists to harmonise policy on airworthiness and operations issues related to separation standards. Its specific responsibilities are:

1. Co-ordinate on issues which may arise in the application of the Minimum Aircraft System Performance Specifications (MASPS).
2. Initiate necessary action to amend aeronautical charts to reflect navigational requirements related to separation standards (e.g. RVSM, Required Navigation Performance (RNP)).
3. Study operational issues related to the role of Airborne Collision Avoidance System (ACAS).
4. Harmonise aircraft operational and airworthiness policy for Automatic Dependent Surveillance (ADS), Controller Pilot Data Link Communications (CPDLC) and other data link initiatives.
5. Coordinate with the NAT ATMG and the NAT CNSG in the development of aircraft operational issues.
6. Study other aircraft operational issues as directed by the NAT SARSIG.
7. Report to the NAT SARSIG.

Composition

The OPS/AIR sub-group is composed of representatives from Canada, France, Ireland, Norway, Portugal, the United Kingdom, the United States, EUROCONTROL, IATA, IFALPA and manufacturers.

The OPS/AIR sub-group meets when required.

THE NAT COMMUNICATIONS, SURVEILLANCE AND NAVIGATION GROUP (NAT CNSG)

Terms of Reference

The NAT CNSG is responsible to the NAT IMG for the harmonisation, overall monitoring and reporting of CNS systems implementation conducted in the NAT Region and other related tasks directed by the NAT IMG. The principle tasks of the NAT CNSG are:

1. Develop the methodology for the CNS systems implementation process including harmonisation of implementation activities, monitoring requirements, reporting functions and arrangements among its members for use and distribution of CNS related data.
2. Develop success criteria and methodology, inclusive of a safety analysis, for assessment of implementation programs.
3. Evaluate CNS systems' end to end performance.
4. Establish and oversee configuration management for the implementation of CNS systems for the NAT Region.
5. Identify and resolve procedural and technical issues critical to the success of CNS systems implementation.
6. Develop application level messages for ground/ground forwarding of data between ATC units.
7. Implement and administer a CNS performance/problem monitoring and reporting system.
8. Develop procedural and/or technical improvements to the use of CNS systems in the NAT Region.
9. Address other issues as directed by the NAT IMG.
10. Report to the NAT IMG.

Composition

The NAT CNSG is composed of representatives from NAT SPG member States as well as participants from IATA, IBAC and IFALPA.

The Group may invite participants from other States, organisations or industry as required.

NAT AERONAUTICAL COMMUNICATIONS SUB GROUP (NAT ACSG)

Terms of Reference

The NAT ACSG reports to the NAT CNSG and is responsible for monitoring and analyzing the efficiency and effectiveness of NAT voice communications facilities and the Aeronautical Fixed Services (AFS).

The main tasks of the NAT ACSG are:

1. Monitor and analyze the efficiency and effectiveness of tools available to general purpose radio communications facilities including HF, GP/VHF and SATCOM voice systems.
2. Address short term issues and propose solutions to problems related to fixed/mobile services.
3. Keep under review the current network management arrangements including the distribution of traffic over the HF families of frequencies and make reservations to resolve unequal distribution of traffic.
4. Provide advice on the operational voice communications requirements related to transition issues associated with the implementation of data link communications technologies.
5. Provide advice/comment, as required, to the NAT CNSG and NAT ATMG on the impact of the implementation of communications systems and/or changes in ATC procedures on voice communications.
6. Address and report to the NAT CNSG regarding issues related to planning and implementation, as directed by the NAT CNSG

Composition

The NAT ACSG is composed of representatives from Canada, Iceland, Ireland, Norway, Portugal, the United States and IATA.

Working Methods

Through correspondence to the extent possible. Meetings may be required from time to time.

TERMS OF REFERENCE FOR A NAT DATA LINK MONITORING AGENCY
(NAT DLMA)

(Paragraph 2.4.15 refers)

Terms of Reference

The NAT Data Link Monitoring Agency (DLMA) will report to the NAT CNSG 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. Monitor and report communications performance, availability and problems, with respect to requirements.
2. Develop and promulgate forms, specifications and procedures required for reporting of problems and routine data.
3. Monitor and report message traffic statistics.
4. Co-ordinate end-to-end system functionality, performance and interoperability.
5. Co-ordinate in order to diagnose and resolve system problems.
6. Co-ordinate the development of ground system navigation databases.
7. Report ATSUs' data link capabilities with respect to trials and operational requirements for the Region. Receive advisories of same from ATS providers.
8. Co-ordinate with similar agencies for other airspaces.
9. Collect notices of service disruptions, restorations and major system changes. Correlate the information same to problems reported.

APPENDIX F – NAT SAFETY OVERSIGHT GROUP (NAT SOG)

(Paragraphs 1.3.26 and 1.3.28 refer)

Policy

Without prejudice to the responsibilities of ICAO contracting States in accordance with ICAO Annex 11, paragraph 2.27 the NAT SOG is responsible for the continuous monitoring and improvement of the safety level of the air navigation system in the NAT Region.

Terms of Reference

The NAT SOG is responsible to the NAT SPG for directing safety oversight and management in the NAT Region. To that end, the NAT SOG will:

1. Review system safety performance in the NAT Region.
2. Share data on safety-related occurrences in the NAT Region.
3. Develop best practices in the management of safety in the NAT Region.
4. Ensure safety-related occurrences in the NAT Region are analysed by the appropriate NAT SPG contributory groups to determine root causes.
5. Identify areas where mitigation is required and/or identify specific mitigation activities.
6. Keep under review safety monitoring methods and analysis and recommend improvements to the process as appropriate.
7. Monitor safety cases in progress and review completed safety cases prepared to support changes to the NAT air navigation system.
8. Address other safety-related issues as necessary.
9. Report to the NAT SPG.

Composition

The NAT SOG is composed of representatives from the NAT SPG member States, Spain, IATA, IBAC, IFALPA and IFATCA. States' representatives should be in a position to address regulatory and service delivery issues related the air navigation system in the NAT Region, and regulatory issues related to the conduct of flight operations in the NAT Region. The NAT SOG may invite participants from other States or organisations as required.

APPENDIX G – NAT SCRUTINY GROUP (NAT SG)

(Paragraph 1.3.28 refers)

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 MNPS airspace.
2. For the purpose of safety management activities, categorize reported occurrences in the NAT Region as directed by the NAT SOG.
3. Under the direction of the NAT SOG, analyse occurrences to determine root causes.
4. Provide advice and recommendations to the NAT SOG regarding mitigation
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 on safety management categorisations to the NAT SOG.
9. Report once per year on mathematical categorisations to the NAT MWG.

Composition The NAT SG is composed of representatives from the NAT SPG member States, Spain, NAT MWG, NAT CMA, IATA, IBAC, IFALPA and IFATCA.

Working Methods The NAT SG conducts its work via correspondence to the extent possible.

APPENDIX H – REVISED TERMS OF REFERENCE FOR THE NAT CMA AND THE NAT MWG

NORTH ATLANTIC CENTRAL MONITORING AGENCY (NAT CMA)

(Paragraph 1.3.28 refers)

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. Establish and amend, as required, mechanisms for the collection and analysis of occurrence data, including operational errors, for use in the risk assessment process.
2. Establish and operate a database of RVSM approvals, for the NAT Region, issued by State aviation authorities.
3. Investigate and analyse the causes of occurrences, including operational errors, in the NAT region and take follow-up action with State aviation authorities as required.
4. Establish a mechanism for the tactical monitoring of aircraft approvals and take follow-up action with State aviation authorities as required.
5. Act as the custodian of all aircraft technical height keeping data collected as part of the NAT Region monitoring process and take follow-up action, as required, with operators and State aviation authorities of aberrant or non-compliant aircraft.
6. Responsibility for the amendment and publication of the "NAT Minimum Monitoring Requirements" table in co-ordination with the NAT MWG and NAT SOG.
7. Provide NAT customers and State aviation authorities with height monitoring data on request.
8. Ensure that the requisite height monitoring is completed by operators of aircraft listed in the RVSM approvals database and to take appropriate action where necessary.
9. Ensure that system risk is assessed each calendar month and that appropriate action is taken if the risk in either dimension exceeds the published target level of safety.
10. Produce a quarterly report on operational performance in the NAT Region for distribution to the NAT SPG, the NAT SOG and other interested parties.
11. Liaison with other regional monitoring agencies in order to achieve an exchange of monitoring and RVSM approvals data amongst the regions.

NAT MATHEMATICIANS' WORKING GROUP (NAT MWG)

(Paragraph 1.3.28 refers)

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 monthly and annually the lateral and vertical occupancies (traffic densities) in the NAT Region.
2. Estimate the current lateral, longitudinal and vertical collision risks to show whether the estimated risks meet the respective Target Levels of Safety (TLS).
3. Identify trends.
4. For the purpose of safety management, identify trends in the component elements of the collision risk model and highlight where safety improvements could prove most effective.
5. To reflect changes in operating conditions within the NAT region, review the collision risk model.
6. 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.
7. Review other mathematical aspects as directed by the NAT SOG and/or the NAT SPG.
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.

Working Methods The NAT MWG conducts its work via correspondence to the extent possible.

APPENDIX I - DRAFT AMENDMENT FOR THE MANDATORY INCLUSION OF THE AIRCRAFT REGISTRATION IN THE ICAO FILED FLIGHT PLAN

(Paragraph 2.4.23 refers)

European and North Atlantic Office

PROPOSAL FOR AMENDMENT OF THE REGIONAL SUPPLEMENTARY PROCEDURES, NAT REGION (Doc 7030/5)

(Serial No.: EUR/NAT-S ../..-… .....)

a) Regional Supplementary Procedures:

Doc 7030/5 – NAT SUPPs

b) Proposed by:

Iceland

c) Proposed amendment:

Insert new text as follows:

2.1.14 Data link services

2.1.14.1 All flights planning to operate in the NAT Region and intending to use data link services shall include in Item 18 of the ICAO flight plan the indicator REG/ followed by the aircraft registration.

End of new text

d) Proposer's reason for amendment:

The current requirement for all RVSM approved aircraft planning to operate in the NAT Region does not extend to other types of operations which may require the aircraft registration. Since the aircraft registration is required for FANS-1/A or equivalent systems by ground systems to unambiguously correlate an aircraft's call sign with the registration as part of the establishment of FANS connectivity, it is necessary that the registration be included in the ICAO filed flight plan. The current requirement for operators to include the aircraft registration in the flight plan does not apply to FANS 1/A or equivalent aircraft.

When developing the proposal for amendment, cognisance was taken of the global applicability of using the aircraft registration to correlate an aircraft to enable the provision of data link services. The draft amendment takes this into consideration.

e) Proposed implementation date of the amendment:

Upon approval by Council.

APPENDIX J - DRAFT PROPOSAL FOR AMENDMENT TO THE NAT SUPPS REGARDING SLOP

(Paragraphs 3.1.75 and 3.1.76 refer)

European and North Atlantic Office

PROPOSAL FOR AMENDMENT OF THE REGIONAL SUPPLEMENTARY PROCEDURES, NAT REGION (Doc 7030/5)

(Serial No.: EUR/NAT-S ../..-… ……)

a) Regional Supplementary Procedures:

Doc 7030/5 – NAT SUPPs

b) Proposed by:

Iceland

c) Proposed amendment:

Amend Chapter 7 as follows:

Insert new text as follows:

7.1 STRATEGIC LATERAL OFFSET PROCEDURES (SLOP)
(A-2, Chapter 3; P-ATM, Chapter 16)

7.1.1 Strategic lateral offset procedures (SLOP) are authorized in the NAT Region. Flight crews of aircraft with automatic offset capability are strongly encouraged to fly a strategic lateral offset of 1 NM or 2 NM to the right of track.

7.1.2 In addition to the provisions specified in the PANS-ATM regarding the use of SLOP, the following provisions apply:

a) flight crews applying a strategic lateral offset should offset as soon as practicable after passing the oceanic entry point and return to centre line as late as practicable before passing the oceanic exit point; and

b) aircraft transiting oceanic ATS surveillance areas should continue to apply the offset, unless otherwise instructed by ATC.

End of new text

d) Proposer's reason for amendment:

The provisions regarding the application of SLOP in the NAT Region were removed from Doc 7030 and incorporated in the PANS-ATM as a global procedure. However, the NAT Region had identified two provisions that were specific to the NAT Region which were not included in the global provisions, namely where to establish the offset and what should be done when

entering radar coverage. In addition, the PANS ATM states that the SLOP should be implemented on a regional basis after coordination between all States involved.

Therefore the recommendation for all aircraft operating in the NAT Region to use the SLOP provisions should be clearly indicated in the NAT SUPPs. In addition, the two provisions specific to the NAT Region should also be explicitly stated in Doc 7030. These two additional provisions complement the current Doc 4444 provisions and do not contradict them at all.

Paragraph 15.2.4.1.2 of the PANS ATM specifies that aircraft may offset 1 or 2 NM to the right of the centre line. However, it has been recognised from the experience gained that most aircraft fly the centre line thus reducing the potential that the full use of offsets would have on reducing risk. It is recommended that the NAT Region adopt a position on the use of SLOP that would be in line with the above referenced paragraph from the PANS-ATM.

The inclusion of the material in the NAT SUPPs would complement the provisions of the PANS ATM and reduce any confusion about how, where and when the SLOP provisions should be used. It would also provide clearer guidance to the suppliers of aeronautical information of what needs to be published.

e) Proposed implementation date of the amendment:

Upon approval by Council.

APPENDIX K – PROPOSAL FOR AMENDMENT TO THE NAT SUPPs FOR THE USE OF SATCOM VOICE FOR ROUTINE ATS IN THE NAT REGION

(Paragraph 3.2.17 refers)

European and North Atlantic Office

PROPOSAL FOR AMENDMENT OF THE REGIONAL SUPPLEMENTARY PROCEDURES, NAT REGION (Doc 7030/5)

(Serial No.: EUR/NAT-S 08/12 – NAT/3)

a) Regional Supplementary Procedures:

Doc 7030/4 – NAT SUPPs

b) Proposed by:

Canada and the United Kingdom

c) Proposed amendment:

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

1. **Modify** the following in Chapter 3, Section 3.4:

"3.4 SATELLITE VOICE COMMUNICATIONS (SATCOM)
(A2 – Chapter 3; P-ATM – Chapter 15; P-OPS, Vol. 1)

3.4.1 ~~Within the NAT Region, aircraft equipped for SATCOM voice shall restrict the use of such equipment to emergencies and non-routine situations. An unforeseen inability to communicate by voice radio constitutes a non-routine situation. Since oceanic traffic typically communicates through aeradio facilities, a SATCOM call due to an unforeseen inability to communicate by other means should be made to such a facility rather than the ATC centre unless the urgency of the communication dictates otherwise. Dedicated SATCOM telephone numbers (short codes) for aeradio facilities and air traffic control facilities are published in national AIPs.~~Aircraft with installed avionics capable of SATCOM voice, as approved by the State of Operator or the State of Registry may use such equipment for ATS communications.

3.4.2 Pilots electing to use SATCOM voice as an alternative to HF voice communications remain responsible for operating SELCAL in accordance with section 3.5.1 or maintaining a listening watch on the assigned HF frequency.

3.4.3 Since oceanic traffic typically communicates through third party air-ground radio facilities, SATCOM voice communications should continue to be made to such facilities rather than ATC centres unless the urgency of the communication dictates otherwise. SATCOM voice communication initiated due to HF propagation difficulties does not constitute urgency and should be addressed to the air-ground radio facility. Dedicated SATCOM voice telephone numbers (short codes) for air-ground radio facilities and air traffic control facilities are published in national AIPs.

d) Proposer's reason for amendment:

The current restriction on the use of SATCOM voice for emergencies and non-routine communications dates back to the tenth Air Navigation Conference. Since then, the costs of SATCOM voice has reduced significantly and the technology has improved therefore providing a cost effective and reliable means of communications for aircraft that are equipped and that wish to avail themselves of SATCOM voice communications facilities in lieu of high frequencies (HF) HF or General Purpose - Very High Frequency (GP-VHF).

The NAT high frequencies (HF) communications network is approaching saturation and a means of reducing the amount of HF communications traffic is necessary otherwise expensive system upgrades will be required. In addition, the rate of implementation of communications via data link, which was supposed to ease the load on HF communications, has not met with expectations.

The authorisation for the use of SATCOM voice for routine ATS communications would provide States with an opportunity to ease the requirements regarding operating HF equipment. Instances of partial failure of the HF communications, one of two radios for example, but with fully functioning SATCOM equipment, has led to the aircraft being held on the ground for repairs thereby incurring considerable penalties to the users.

e) Proposed implementation date of the amendment:

Upon approval by Council.

f) Proposal circulated to the following States and international organizations:

The proposal has been circulated to the following States and International Organizations:

g) Secretariat comments:

The proposal for amendment was endorsed by the 44th Meeting of the NAT SPG (Conclusion 44/13 refers). The supporting documentation can be found in the Report of the 4th Meeting of the NAT-SATCOM Voice Task Force and in the User's Guidance Material. Both documents can be obtained at the following URL:
http://www.paris.icao.int/documents_open/subcategory.php?id=106

The use of SATCOM voice in the NAT Region was limited to emergencies and non routine communications. However, several ATS providers had started analysing the possible use of SATCOM voice as a valid communications media for routine ATS communications. To support the use of SATCOM voice, NAT Air Navigation Service Providers (ANSP), supported by Inmarsat, the Communications Service Providers (CSP) and volunteer airlines conducted a trial named "NAT-Satvoice Trial" to asses the feasibility of using SATCOM Voice for routine ATS communications. The trial was conducted between May 01 2007 and August 31 2007 involving the five main radio stations in the NAT-region: Gander, Iceland, New York, Santa Maria and Shanwick radio stations.

The trials were successful in proving that the radio and crew procedures and security measures developed for the use of SATCOM during the trial were adequate and could be globally implemented.

APPENDIX L – CHANGES TO THE MNPS AIRSPACE OPERATIONS MANUAL

(Paragraph 4.1.4 refers)

(Note: proposed new text is presented in grey shading)

…

Adherence to Cleared Mach Number

7.3.4 In the application of Mach Number Technique, pilots must adhere strictly to their assigned True Mach Numbers unless a specific re-clearance is obtained from the appropriate ATC unit. However, as the aircraft weight reduces it may be more fuel efficient to adjust the Mach Number. Since the in-trail and crossing track separations between individual aircraft are established on the basis of ETAs passed to, or calculated by, ATC, it is essential that ATC approval is requested prior to effecting any change in cruise Mach Number. Such approval will be given if traffic conditions permit. **Pilots must recognise that adherence to the assigned Mach Number is essential. No tolerance is provided for. Pilots must not utilise Long Range Cruise or ECON FMC modes when transiting NAT MNPS airspace**. If an immediate temporary change in the Mach Number is essential, e.g. due to turbulence, ATC must be notified as soon as possible. Pilots with experience of flying in oceanic airspaces other than the North Atlantic, may be familiar with a procedure in those areas which permits pilots to unilaterally elect to change their cruising Mach Number by up to 0.02M, without prior ATC approval. **This is not the case in the North Atlantic MNPS Airspace.**

Broadcasting Position and Intentions when Executing Contingency Manouvres

11.2.2 If prior clearance cannot be obtained, an ATC clearance should be obtained at the earliest possible time and, in the meantime, the aircraft should broadcast its position (including the ATS Route designator or the Track Code as appropriate) and its intentions, at frequent intervals on 121.5 MHz (with 123.45 MHz as a back-up frequency). It must be recognised that due to the use of CPDLC, Station-to-Station SATCOM Voice and SELCAL with HF communications in North Atlantic operations, pilots' situation awareness, of other potentially conflicting traffic, may be non-existent or incomplete. If, however, the aircraft is in an area where ATC communications are being conducted on VHF, pending receipt of any reclearance, the position and intentions should be broadcast on the current control frequency, rather than 123.45 MHz.

Possible TCAS Target Warnings Resulting from ATC Employment of "5 Minutes GNSS Climb/Descent Through Procedure".

11.6.4 TCAS registers targets up to 40 NMs. Depending upon OAT/ambient air density, a Mach of about 0.85 equates to a TAS of approx 480 Kts, or 8 NMs per minute. Since the longitudinal separation standard employed in the North Atlantic is 10 minutes, pilots would consequently not normally expect their TCAS to register targets at the same level, whether these may be in-trail, crossing, climbing or descending through their level. However, since January 2009, some NAT ATC units are utilising a procedure which permits ATC to clear an aircraft to climb or descend through the level of another aircraft, with as little as 5 minutes longitudinal separation, provided that both aircraft are using GNSS (GPS) for position determination and reporting. Many NAT aircraft request and are cleared at lesser Machs than 0.85. A 5 minutes in trail separation between two aircraft flying at M0.80 and experiencing a headwind component of 30 Kts (not unusual for W/B NAT flights), will equate to approx 35 NMs. Furthermore, depending upon the rounding/truncating protocols used by Pilots, FMSs and/or ATC Flight Data Processing Systems (for "minutes and seconds" to "minutes"), a nominal 5 minutes separation can in fact be close to an actual 4 minutes (it can, of course, also be 6 minutes). In such a circumstance the actual longitudinal separation could be less than 30 NMs. In these cases TCAS may register targets.

The rule allowing ATC to use this procedure includes a caveat that the climb or descent needs to be undertaken within 10 minutes of the time that the second aircraft in the pair has passed a common reporting point. Consequently, the pilot of an aircraft cleared for a climb or descent of more than a single flight level, should be alerted to the possibility of such a close-encounter occurrence by the controller's use of the conditional phrase "By" or "At or Before" in the clearance received. However, the pilot of the "passive participant" aircraft of the 5 minutes separated pair, if it is the following aircraft, could be presented with a "pop-up" TCAS target without such a warning. The bulletin announcing the introduction of this procedure in the North Atlantic includes the following instruction;- "If there is any concern regarding the proximity of another aircraft, flight crews must not hesitate to clarify the situation and take appropriate action to ensure the safety of the flight." However, given the air/ground communications methods employed in the NAT, the pilot may not receive a response to such a request for "clarification" prior to the other aircraft passing its flight level. Nevertheless, even at these separations Resolution Advisories are not anticipated and it is not expected that pilots will consider deviating from their clearance as "appropriate action".

LIST OF ACRONYMS

ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance-Broadcast
ADS-C	Automatic Dependent Surveillance- Contract
AFTN	Aeronautical Fixed Telecommunications Network
AIC	Aeronautical Information Circular
AIDC	Air Traffic Services (ATS) Inter-Facility Data Communication
AIP	Aeronautical Information Publication
ANC	Air Navigation Commission
AN-Conf/11	11th Air Navigation Conference
ANP	Air Navigation Plan
ANS	Air Navigation System
ANSP	Air Navigation Service Provider/s
AO	Aircraft Operations
APAC	Asia/Pacific
ASE	Altimetry System Error
ASP WGW/1	First Meeting of the Working Group of the Whole of the Aeronautical Surveillance Panel
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
NAT ATMG	NAT Air Traffic Management Group
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Services
BOTA	Brest Oceanic Transition Area
CAA	Civil Aviation Authority
CAR	Caribbean
CEANS	Conference on the Economics of Airports and Air Navigation Services
CMA	Central Monitoring Agency
CNS	Communications, Navigation and Surveillance
CNS/ATM	Communications, Navigation and Surveillance/Air Traffic Management
CPDLC	Controller Pilot Data Link Communications
CPWG	Cross Polar Trans East Air Traffic Management Work Group
CSP	Communications Service Providers
EANPG	European Air Navigation Planning Group
EUR	European
EUR/NAT	European and North Atlantic
FAA	Federal Aviation Administration
FAB	Functional Airspace Blocks
FABEC	Central European Functional Airspace Block
FANS	Future Air Navigation Systems
FANS 1/A	Boeing/Airbus implementations of FANS
fapfh	fatal accidents per flight hour
FASID	Facilities and Services Implementation Document
FDPS	Flight Data Processing System
FIR	Flight Information Region
FPL	Filed Flight Plan
FTP	File Transfer Protocol
GAATS	Gander Automated Air Traffic System
GASP	Global Aviation Safety Plan
GMU	Global Positioning System Monitoring Unit
GNE	Gross Navigation Error
GNSS	Global Navigation Satellite System

GP	General Purpose
GPS	Global Positioning System
HF	High Frequency
HMU	Height Monitoring Unit
HTTP	hypertext transfer protocol
IAA	Irish Aviation Authority
IATA	International Air Transport Association
IBAC	International Business Aviation Council
ICAO	International Civil Aviation Organisation
ICD	Interface Control Document
IFALPA	International Federation of Air Line Pilots' Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
ITU	International Telecommunication Union
LHD	Large Height Deviation
MET	Meteorology
MHz	Mega Hertz
MID	Middle East
MNPS	Minimum Navigation Performance Specifications
MWO	Meteorological Watch Office
NACC	North American, Central American and Caribbean
NAM	North American
NAT	North Atlantic
NAT ACG	North Atlantic Aeronautical Communications Group
NAT ACSG	Nat Aeronautical Communications Sub-Group
NAT ASM	North Atlantic Application of Separation Minima (Document)
NAT-CC ICD	NAT Common Coordination Interface Control Document
NAT CNSG	NAT Communications, Surveillance and Navigation Group
NAT DEMA	NAT Deviations and Errors Monitoring Application
NAT DMO	NAT Document Management Office
NAT EFG	North Atlantic Economic and Financial Group
NAT FAM	NAT Fee Analysis Model
NAT FCMA	North Atlantic FANS Central Monitoring Agency
NAT IMG	North Atlantic Implementation Management Group
NAT MWG	North Atlantic Mathematicians Working Group
NAT OPS MNG	North Atlantic Operations Managers
NAT SG	North Atlantic Scrutiny Group (NAT SG)
NAT SMCG	North Atlantic Safety Management Coordination Group
NAT SOG	North Atlantic Safety Oversight Group (NAT SOG)
NAT SPG	North Atlantic Systems Planning Group
NAT TFG	North Atlantic Traffic Forecasting Group
NM	Nautical Mile
NPRM	Notice of Proposed Rule Making
NSA	National Supervisory Authorities
OAC	Oceanic Area Control Centre
OESB	Oceanic Error Safety Bulletin
Ofcom	Office of Communications
OPLINKP	Operational Data Link Panel
OTS	Organized Track System
PAC	Pacific
PANS-ATM (Doc 4444)	Procedures for Air Navigation Services – Air Traffic Management (Doc 4444)
PBN	Performance based navigation
PCO	Programme Co-ordination Office
PIRG	Planning and Implementation Regional Group
RAN	Regional Air Navigation
RCP	Required Communications Performance
RNP	Required Navigation Performance
RVSM	Reduced Vertical Separation Minimum
SAATS	Shanwick Automated Air Traffic System

SAR	Search and Rescue
SARPs	Standards and Recommended Practices (ICAO)
SASP	Separation and Airspace Safety Panel
SATCOM	Satellite Communications
SCNATF	Surveillance and Communications in Northern Airspace Task Force
SELCAL	Selective Calling System
SLOP	Strategic Lateral Offset Procedure
SOTA	Shannon Oceanic Transition Area
SSR	Secondary Surveillance Radar
SUPPs	Regional Supplementary Procedures
SVTF	Satellite Voice Task Force
TLS	Target Level of Safety
TRASAS	Trans-Regional Airspace and Supporting ATM Systems Steering Group
URL	Uniform Resource Locators
VAAC	Volcanic Ash Advisory Centre
VHF	Very High Frequency
VOLCEX SG	Volcanic Ash Exercises Steering Group
WACAF	Western and Central African
WATRS	West Atlantic Route System
www	World Wide Web

– END –