NAT SPG/38

Summary of Discussions and Conclusions of the

Thirty-Eighth Meeting of the

North Atlantic Systems Planning Group

Paris, 11 to 13 June 2002

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FOREWORD

i. Introduction

i.1 The Thirty-Eighth Meeting of the North Atlantic Systems Planning Group (NAT SPG) was held in the European and North Atlantic (EUR/NAT) Office of ICAO from 11 to 13 June 2002.

i.2 The Meeting was chaired by **Mr Ásgeir Pálsson**, the Member from Iceland. Mr Christian Eigl was the Secretary of the Meeting and was assisted by Mr Jacques Vanier from the EUR/NAT Office of ICAO. Assistance was also provided by Mr Jean-Claude Bugnet, Chief of the Joint Financing Section and Mr Herman Pretorius from Regional Affairs Office, both from ICAO Headquarters and by Mr. Robert Kruger and Mrs Nikki Goldschmid from the EUR/NAT Office of ICAO.

i.3 In the opening session, Mr Ásgeir Pálsson welcomed the new Member from the United Kingdom, **Mr George Ballantyne** who replaced Mr George Ennis. Mr Gerry Richard stood in for Mr Drazen Gardilcic, the Member for the United States who was unable to attend. The Chairman also informed the Group that Canada had sent their apologies that they could not attend due to the short notice of sickness of its Member.

i.4 In addition to the Members of the NAT SPG, the Russian Federation, Spain, the International Air Transport Association (IATA), the International Air Carriers Association (IACA), the International Council of Aircraft Owner and Pilot Associations (IAOPA), the International Business Aviation Council (IBAC), the International Federation of Air Line Pilots Associations (IFALPA), the International Federation of Air Traffic Controllers' Associations (IFATCA) and the International Maritime Satellite Organization (Inmarsat) had been invited to attend the meeting. IACA, IAOPA and Inmarsat presented their apologies for not being able to attend. A list of participants is at **Appendix A**.

i.5 The Mathematicians' Working Group (MWG) had met at the National Air Traffic Services (NATS) Ltd, Headquarters, in London from 22 to 26 April 2002 to consider the mathematical and statistical aspects of the safety of separation minima applied in the NAT Region. **Mr Keith Slater**, the Rapporteur, presented the MWG report in support of the assessment of current system safety performance in terms of lateral, vertical and longitudinal collision risk.

i.6 The Scrutiny Group (SG) had met concomitantly with the MWG at the National Air Traffic Services Ltd, Headquarters, in London on 23 and 24 April 2002 and had been charged with the scrutiny of navigation performance in the NAT Region. The Rapporteur, **Mr Jim Benson** of the United Kingdom, provided the NAT SPG with their report.

i.7 The Aeronautical Communications Sub Group (ACSG) had met in Shannon (Ireland) on 10 and 11 December 2001. The Rapporteur, **Mr Joaquim Cabral** of Portugal, provided the Group with the report on the current use of High Frequency (HF) in the NAT Region.

i.8 The NAT Traffic Forecasting Group (NAT TFG) had met in the EUR/NAT Office of ICAO from 7 to 16 May 2002 and had submitted a Summary of Discussions as well as a report to the NAT SPG containing short, medium and long term forecasts.

i.9 The NAT Implementation Management Group (NAT IMG) had met twice since NAT SPG/37 and a report on their activities had been presented to the Group.

i.10 The NAT Economic and Financial Group (NAT EFG) had met twice since NAT SPG/37 and a report on their activities and findings had been presented to the Group.

i.11 The NAT SPG expressed its appreciation to all those that had worked within the above mentioned groups for the quality of the material that they had produced.

i.12 The Group approved the following Agenda.

Agenda Item 1: Developments

- 1.1 ICAO Panels and Committees
- 1.2 Adjacent Regions
- 1.3 NAT provider States
- 1.4 Technology

Agenda Item 2: Planning and implementation

- 2.1 NAT Implementation Management Group (NAT IMG) report
- 2.2 Outcome of the NAT Economic and Financial Group (NAT EFG) meetings
- 2.3 NAT Traffic Forecasting Group (NAT TFG) report
- 2.4 Other issues

Agenda Item 3: Air navigation system review

- 3.1 Review of system safety performance
  - a) Scrutiny matters
  - b) Mathematical matters
- 3.2 Review of systems operations
  - a) Operations Managers report
  - b) Communications sub-group report
  - c) System efficiency

Agenda Item 4: Documentation update

- 4.1 Minimum Navigation Performance Specifications (MNPS) Operations (OPS) Manual
- 4.2 Guidance material
- 4.3 International General Aviation (IGA) Manual
- 4.4 Other documentation

Agenda Item 5: Any other business

- 5.1 Support to the NAT SPG
- 5.2 NAT SPG working methods
- 5.3 Next meeting

1. DEVELOPMENTS

1.1 ICAO Panels and Committees

1.1.1 The Group was informed that preparations were now underway to convene an Air Navigation Conference in the fall of 2003. One of the main objectives of the Conference will be to endorse a global Air Traffic Management (ATM) Concept of Operations. The Group was also provided information relating to activities of the Separation and Airspace Safety Panel (SASP), the Operational Data Link Panel (OPLINKP) and the Air Traffic Management Operational Concept Panel (ATMCP).

1.1.2 The Group was also informed of the recent amendment to Annex 11 which included a requirement to implement safety management programmes.

1.2 Adjacent Regions

ACTIVITIES IN ADJACENT REGIONS

European (EUR) Region

1.2.1 The Group noted that reduced vertical separation minimum (RVSM) had been implemented in the EUR Region very smoothly on 24 January 2002. In fact, it was highlighted that all Air Traffic Flow Management (ATFM) measures that had been imposed to safeguard capacity had been removed by 2 February 2002. In this connection, it was pointed out that some problems, such as the utilisation of flight levels, had occurred because of the transition from the NAT to the EUR Regions but these issues had been resolved. It was also noted that the implementation of 8.33 kHz channel spaced radios would be expanded to the entire EUR Region horizontally as of October 2002 and that it was expected that the vertical expansion downwards would take place circa 2008. The Group re-affirmed its previous position that the requirements arising from implementation of new programmes in adjacent regions should not impact procedures in the NAT Region without first having passed through the NAT planning machinery.

CONCLUSION 38/1 - INTEGRITY OF THE NORTH ATLANTIC PROCESS

That the NAT Implementation Management Group ensure that the implementation of new programmes in adjacent regions be evaluated within the NAT planning mechanism in order to reduce the possible impact on procedures in the NAT Region.

1.2.2 The Group was provided with a brief outline of activities related to the European Union's initiative "Towards a Single Sky for Europe".

North American (NAM) Region

1.2.3 It was noted that Canada had successfully implemented RVSM in its Northern Canadian airspace on 18 April 2002. The area concerned was all the airspace between FL 290 and FL 410 North of 57° North and a transition area between 52° North and 57° North had been established. The Group also noted that expansion of RVSM to the Southern part of Canadian Domestic airspace would take place concurrently with the United States' Domestic RVSM programme.

1.2.4 The Group was informed that implementation of RVSM in the Caribbean Region (CAR) was planned to take place in December 2004, also in conjunction with the implementation of RVSM in United States' Domestic airspace. It was noted that this would affect the present transition procedures between the NAT and CAR Regions and that the United States had taken this into account in its planning.

1.2.5 As regards the planned implementation of RVSM in domestic United States airspace, the Group noted that the current plans indicated that an implementation date of December 2004 was realistic and achievable. However, when examining some of the issues that were being addressed within the Federal Aviation Administration (FAA) to support the implementation of RVSM, it was pointed out that the United States may be certifying aircraft for RVSM operations that did not conform to Interim Guidance Material 91-RVSM Revised or Joint Aviation Authorities (JAA) Temporary Guidance Leaflet (TGL) 6 (e.g. single altimetry requirement vs dual altimetry requirement) and therefore would not conform to the global RVSM Minimum Aircraft System Performance Specification (MASPS). The Group voiced concern that this could cause considerable problems, as the Central Monitoring Agency's (CMA) aircraft approval data base could be compromised. In addition, operational problems would arise because of the difficulty of determining the approval status of an aircraft on the basis of flight plan information.

1.2.6 The Group considered a proposal from the NAT IMG relating to operations of non-MASPS compliant RVSM approved aircraft, particularly the planned implementation of RVSM in United States domestic airspace. In this regard, the member from the United States provided information on this issue which had not been available at the time of the NAT IMG discussions and provided a number of reassurances, namely:

a) the United States proposal does not allow single compliant altimetry equipped aircraft to operate outside the domestic airspace of the United States;

b) the FAA RVSM approval data base will track these aircraft as a separate category and the information will be shared;

c) Communications, Navigation and Surveillance (CNS) (very high frequency (VHF) and radar) tools are available to a pilot experiencing difficulties;

d) only a very small percentage of flights would be conducted by such aircraft; and

e) such aircraft will meet stringent airworthiness requirements.

1.2.7 The NAT SPG reaffirmed its previous decision that aircraft that do not meet the global MASPS should be excluded from NAT RVSM airspace and from the RVSM approvals data base. In addition, the Group agreed that States proposing to certify such aircraft develop appropriate safeguards to mitigate inadvertent RVSM operations outside their domestic airspace.

CONCLUSION 38/2 - OPERATIONS OF NON ICAO MINIMUM AIRCRAFT SYSTEM PERFORMANCE SPECIFICATION (MASPS) COMPLIANT REDUCED VERTICAL SEPARATION MINIMUM (RVSM) APPROVED AIRCRAFT IN THE NORTH ATLANTIC (NAT) REGION

That:

a) States proposing to certify general aviation turbo-prop aircraft with single RVSM compliant altimeters ensure that RVSM operations be limited to their domestic airspace; and

b) appropriate safeguards and procedures be developed to mitigate possible inadvertent RVSM operations outside domestic airspace.

1.3 NAT Provider States

1.3.1 The Group was informed that the new flight data processing system (FDPS) in Reykjavik Area Control Centre (ACC) has been commissioned and was now in full operation. The Member for Portugal informed the Group that the new FDPS in Santa Maria was declared operational in July 2001.

Finally the Member for the United States informed the Group that their new Air Traffic Oceanic Planning System (ATOPS) was on schedule and should be delivered to Oakland ACC in April 2003 and to New York Oceanic Area Control Centre (OAC) six months later.

2. PLANNING AND IMPLEMENTATION

2.1 Report of the NAT Implementation Management Group

2.1.1 The Group noted that the NAT IMG had met twice since NAT SPG/37. Because of the events of September 11 2001, its Air Traffic Management Group (NAT ATMG) did not meet. However, its Future Air Navigation Systems (FANS) Implementation Group (NAT FIG) met twice and the Mathematicians Implementation Group (NAT MIG) met once. The ad hoc High Frequency (HF) Transition Review Group met three times.

The NAT IMG Cost Effectiveness (NICE) Programme

2.1.2 The Group noted that the NICE Group's data bases were being maintained. It was also noted that other data bases containing fleet and type equipage existed, including the one developed by the NAT TFG, and that new integrated data bases could be created, based on existing ones, to provide additional planning information to the NAT IMG and the work being carried out in connection with HF regression. The Group noted that the integration of data bases would be pursued by the NAT IMG to assist planning in the NAT Region.

Programme Co-ordination Officer (PCO)

2.1.3 The Group noted that the United Kingdom was willing to continue to provide the NAT PCO support as it essentially only involved administrative issues for the time being. The Group expressed its appreciation to the United Kingdom and also recognised that the NAT PCO function was important to the evolution of the NAT System.

FANS 1/A Operational Trials

2.1.4 The Group was presented with an update on the progress of the Automatic Dependent Surveillance (ADS) Waypoint Position Report (WPR) operational trials being carried out. In this connection, it noted that Guidance Material had been put under configuration management through the FANS Central Monitoring Agency (FCMA). The Group was also informed that the FCMA planned to develop forms and methodologies to report system performance. Following completion of this task, the NAT SPG will be presented with the results of this work for their endorsement.

2.1.5 The Group was informed that work had begun to determine the expected costs of supporting the FCMA. In this connection, the Group noted that Canada was willing to provide the currently necessary resources and support the FCMA and that the information concerning costing would be very useful when determining the future requirements to support NAT activities.

2.1.6 The Group was apprised of the need for close co-ordination between the NAT FIG and the ACSG. In this connection, the Group accepted with appreciation the offer by Portugal to act as the focal point to carry out this task.

Transition from operational trials to an operational system

2.1.7 The Group was presented with information concerning the issues surrounding moving from an operational trial to an operational system. In this connection, it was recalled that monitoring the health of

the system was within the remit of the NAT SPG and that operational systems fit into that remit. The Group noted that not all issues related to moving from an operational trial to an operational system could be resolved at the time by the NAT IMG. Noting that this issue was best addressed by the NAT IMG, it was agreed that they should include this task in their work programme.

2.1.8 The Group was presented with information from France regarding the methodology used in the Pacific Region for Controller Pilot Data Link Communications (CPDLC) trials and implementation. The Group noted that France had offered to present an information paper on this item to the next NAT IMG meeting.

CONCLUSION 38/3 - DEVELOP GUIDELINES TO MOVE FROM AN OPERATIONAL DATA LINK TRIAL TO AN OPERATIONAL SYSTEM

That the NAT Implementation Management Group develop guidelines to be used to move from an operational data link trial to an operational system.

The use of lateral offsets

2.1.9 In follow up to NAT SPG Conclusion 37/8, the Group was presented with a proposal for amendment concerning the use of lateral offsets in the NAT Region to reduce the lateral overlap probability, whilst taking into consideration wake turbulence (paragraph 3.1.49 also refers). The Group examined the proposal to amend the NAT *Regional Supplementary Procedures* (SUPPs) (Doc 7030) which is at **Appendix B**. On the basis of the information presented and taking account of the trial being carried out in the West Atlantic Route System (WATRS), it was agreed that the NAT SUPPs be amended to include offsets up to a maximum of 2 NM to the right of track. As regards the concerns raised by IBAC related to the effects of wake turbulence on business aircraft, it was decided that the proposal for amendment should include a note to reference the pilots' responsibility to use his/her judgement to determine the most appropriate action in any given circumstance. Whilst supportive of the intent of the note, it was IBAC's view that it was inappropriate to expect the pilot-in-command to exercise "final authority" in order to deviate exceptionally from a prescribed procedure merely as a precautionary measure to avoid the potential hazards of wake turbulence. It was also agreed that the lateral offsets should be maintained whilst within radar coverage in the NAT Region. With the foregoing in mind, it was noted that the United States would make the necessary arrangements to initiate the proposal for amendment.

2.1.10 In concluding its review of this issue, the Group agreed that the NAT IMG should study the effect that using lateral offsets may have on contingency procedures. This would not affect the requirement for the offsets but a change to the contingency procedures may be required.

CONCLUSION 38/4 - INITIATE AN AMENDMENT PROPOSAL TO THE NAT REGIONAL SUPPLEMENTARY PROCEDURES (SUPPS) (DOC 7030) FOR THE USE OF LATERAL OFFSETS TO MITIGATE RISK

That:

a) the United States, on behalf of the NAT SPG, initiate an amendment proposal to the NAT Regional Supplementary Procedures as contained in Appendix B to the Report on Agenda Item 2; and

b) the NAT IMG study the effects that the application of lateral offsets may have on contingency procedures.

Proposal for amendment to the NAT SUPPs concerning MET reporting using data links

2.1.11 The Group was presented with a draft proposal for amendment to the NAT SUPPs concerning MET reporting using data link applications. The proposal for amendment, which had been originated by the Secretary General, stemmed from Amendment 70 to Annex 3. Following some changes to ensure that NAT Region requirements were properly addressed, it was agreed that the proposal for amendment, which is at **Appendix C**, be endorsed and that arrangements be made to formally process it.

CONCLUSION 38/5 - MET REPORTING IN THE NAT REGION USING DATA LINKS

That, the European and North Atlantic (EUR/NAT) Office of ICAO make arrangements to formally process the proposal for amendment to the NAT Regional Supplementary Procedures as contained in Appendix C to the Report on Agenda Item 2.

The use of satellite communication (SATCOM) voice in the NAT Region

2.1.12 In follow up to NAT SPG Conclusion 37/11, the Group was presented with reports from Iceland and Portugal on the trial use of SATCOM voice for position reporting. In both cases, the trials had been successful and no major difficulties had been encountered; however, utilisation of the service had been limited. It was noted that the use of SATCOM voice had proven to be very useful during periods of HF blackout. The Group noted that the trials would continue and that ways and means would be explored to facilitate the establishment of uplink communications. In this connection, it was also noted that the issues associated with the cost of uplink communications needed to be included in future studies.

CONCLUSION 38/6 - TRIALS USING SATELLITE COMMUNICATION (SATCOM) VOICE

That, Iceland and Portugal continue exploring ways and means of using SATCOM voice, including ground initiated dialogues, to support the provision of Air Traffic Services in the NAT Region.

The RVSM programme

2.1.13 The Group noted with appreciation that all States concerned had successfully implemented RVSM in the entire NAT Region on 24 January 2002. It was pointed out that no significant technical or operational problems had been identified.

2.1.14 It was brought to the attention of the Group that recent studies on the stability of Altimetry System Errors (ASE) had indicated that preliminarily evidence had shown that ASE of certain airframes monitored may be changing. In this connection, it was recalled that the stability of ASE was a cornerstone of the current NAT RVSM monitoring programme as well as the basis for the usage of Global Positioning System (GPS) Monitoring Units (GMU). With this in mind, it was noted that monitoring would continue until issues concerning the stability of ASE have been resolved and global monitoring requirements have been assessed (paragraph 3.1.53 also refers).

2.1.15 In this context, it was noted that the existing HMU in Strumble was essential in order to provide a data collection period that was sufficiently long to provide the confidence required. The Member for the United Kingdom indicated that there was no immediate threat to the Strumble HMU; however, some refurbishment would be necessary and the Group was informed that it may not be technically possible without significant expense. With this in mind, the Group noted that depreciation of the existing equipment will be completed in 2004 and that, if continuation of these activities was deemed necessary, revising the existing arrangements may be necessary. Information on the financial aspects on this joint financing programme was made available to the Group by the ICAO Chief of Joint Financing.

2.1.16 As regards the development of global monitoring requirements, and keeping in mind NAT SPG Conclusion 37/5, the Group noted that this activity had been initiated and that the Member for the United States had agreed to keep the NAT IMG informed of developments taking place within the Separation and Airspace Safety Panel (SASP).

The reliability of the Central ADS (CADS)

2.1.17 In follow up to NAT SPG Conclusion 37/2, the Group was presented with information that addressed the reliability of the CADS. From the analysis contained, it appeared that there were two key areas that affected the reliability of CADS. The most critical point of failure was the CADS system operated by ARINC. The second most critical point of failure was the use of SATCOM. From the study carried out, it had been shown that 93% of all data link position reports sent at 30° West use SATCOM. Of these messages, 73% rely on ARINC ground/ground network connections to SATCOM Ground Earth Stations (GES). However, there appeared to be sufficient redundancy in both these systems. As the use of data link technology in the NAT increases, the reliability of this technology will become increasingly important. Nevertheless, the Group was informed that the current infrastructure was sufficiently robust to sustain the ADS WPR trials and that it was not necessary to develop any contingency plans for the time being. It was also noted that the NAT FCMA was following up this matter.

Contingency plans to mitigate volcanic eruptions

2.1.18 In follow up to NAT SPG Conclusion 37/1, the Group was presented with a report on the work carried out to develop contingency plans to mitigate the effects of volcanic eruptions. The Group noted that a draft document developed by Iceland and the United Kingdom had not been sufficiently reviewed by specialist organisations in order to submit it for endorsement. It was also noted that such a review process would be initiated by the NAT IMG.

2.1.19 The Group noted that the information dissemination process would be tested by means of a simulation exercise. This would not extend to the end users (aircraft in flight and dispatchers) but the Area ACC, Meteorological Watch Offices (MWO) and the London Volcanic Ash Advisory Centre (VAAC) would be involved. Such a simulation should exercise the alerting process (both for an aircraft-reported ash cloud and an MWO advisory of an imminent/occurring eruption) as well as the messages generated (NOTAM, Volcanic Ash Advisory, SIGMET). It was noted that Iceland and the United Kingdom would manage the simulation. The Group agreed that NAT SPG/39 should be provided with a progress report.

CONCLUSION 38/7 - DEVELOPMENT OF A NAT VOLCANIC ASH CONTINGENCY PLAN

That, the NAT Implementation Management Group (NAT IMG) expedite its work to develop a NAT volcanic ash contingency plan and ensure its early publication

Planning for the transition from High Frequency services

2.1.20 The Group noted that the NAT IMG had completed its initial work on HF regression and that a report was now available. The Group noted that the report recognised the trend towards increased use of data link on the NAT with a consequent impact on HF service voice provision. The report also addressed the possible consequences for HF voice service. The analyses undertaken did not address costs or socio-economic issues as this was not in the review group's remit but these were important issues that would play a significant part in decisions on consolidation of HF Service Providers. On the basis of positive contributions from HF Service Providers on indicative staffing profiles, and the consequent aggregate picture for HF voice service provision in the NAT, the report indicated the potential for a significant staff reduction from the current group of 6 Providers but further savings were probable as consolidation options were pursued. The financial impact of any decommissioning as a result of consolidation would need to be considered as well as how such exit costs could to be recovered. The expertise in the review group determined that a reduction in

volume from 3.8 to 1 million voice messages from 2001 to 2010, an analysis in the Portuguese message projection study with data link had shown this assumption to be probable, could be supported with reduced HF service capacity. The Group expressed the view that this objective could be achieved by reducing the number or size of the HF service providers.

2.1.21 The Group noted that the results of the air-ground message predictions had indicated that if data link was not implemented in the broad timescales proposed by the Providers then, in the long term, the current Aeronautical Stations Network would find it difficult to handle the volume of air-ground voice messages required.

2.1.22 On the basis of the information presented, the Group noted that the system safety, financial, technical and operational implications of identified options in the report needed to be examined. The Group also noted that the HF voice requirements in a data link environment needed to be identified. It was recognized that, while the NAT SPG can agree on the future HF voice requirements for the NAT Region, the final decision in relation to HF consolidation rested with the States themselves. The Group noted that the timeframe to advance this task would be to provide NAT SPG/39 with a progress report in order to be able to take a decision in the fall of 2003. To achieve this, it was noted that the Ad Hoc HF Review Group established by the NAT IMG would continue its work. However, in order to address safety, technical, financial concerns as well as future HF voice requirements in a data link environment, the group would be expanded. In addition, the user community would be invited to participate in the work.

2.1.23 In addition to the foregoing, the Group noted that the NAT IMG would develop clear terms of reference, taking account of the need to nominate a new Chairperson, for its expanded Ad Hoc group which would include the above-mentioned issues. The Group agreed that NAT SPG Conclusion 36/6 was still valid and therefore noted the work carried out by the NAT IMG concerning HF regression and endorsed its plan to further the work.

Development of operational Key Performance Indicators (KPI)

2.1.24 In follow up to NAT SPG Conclusion 36/9, the Group was provided with a progress report on work being carried out by the NAT IMG to develop operations related KPIs. In this connection, it was recalled that work was also being carried out by the NAT EFG (paragraph 2.2.6 also refers). The Group noted that a draft set of performance indicators had been developed but that additional work was required before they could be submitted to the NAT SPG for endorsement. Finally, the Group noted that NAT SPG/39 would be provided with additional information.

2.2 Report of the NAT Economic and Financial Group meetings

2.2.1 The NAT EFG had met twice since NAT SPG/37. The first meeting concentrated on defining methods to improve cost recovery, charging, billing and collection. The second meeting concentrated on finalising a common NAT template to report costs and agreeing on what needed to be reported to NAT SPG/38.

Organizational changes, working methods and work programme

2.2.2 The Group noted that the NAT EFG had carried out a review of its working structure on the basis of its terms of reference and had agreed that no changes were required. As regards the frequency of meetings, it was noted that, under normal circumstances, no more than two meetings per year would be required.

2.2.3 The Group also noted that the NAT EFG had carried out a review of the work programme that had been endorsed by the NAT SPG (paragraph 2.3.2 of NAT SPG/37 report refers). When reviewing this programme, the NAT EFG had felt that the work programme had been narrowed down to areas where

progress could be made in the near to medium term and to issues that were longer term by nature or may involve institutional changes. The Group noted that the NAT EFG would concentrate its efforts on those tasks that could provide benefits in the short term.

The development of a standard template to report annual expenditures

2.2.4 As had been reported to NAT SPG/37, the NAT EFG was developing a common template to report annual expenditures so that all concerned were using the same baseline when examining each other's expenditures. In addition, the NAT EFG had spent considerable time developing a commonly agreed set of terminology to be used in conjunction with the template. In this connection, the Group noted that the definitions would follow the format of the template and would be an integral part of the template.

2.2.5 The objective of the template was that it be used for benchmarking purposes. However, before this could be achieved, the Group noted that a greater understanding of the cost allocation methods used by the different Air Navigation Services (ANS) providers was necessary. To this end, the NAT EFG had agreed that all ANS providers should present an overview of their cost allocation method to the next meeting of the NAT EFG. To further support this activity, the Group noted that the United Kingdom, in conjunction with Canada, would carry out a case study that would compare the cost of the Oceanic ATC services provided by Gander and Prestwick, including the cost allocation methods used. The Group noted that work in this area should be completed by NAT SPG/39.

Development of performance indicators

2.2.6 The Group was informed that a full understanding of cost allocation methodologies used by the ANS providers was a fundamental requirement needed to develop performance indicators. In addition, it had been recognised that the NAT IMG required some inputs from the NAT EFG before they could begin developing operational performance indicators. With this in mind the Group noted that this was a priority item on the work programme of the NAT EFG.

Best practices for cost recovery and charging

2.2.7 In its attempt to determine best practices for cost recovery and charging, the NAT EFG had reviewed a sample invoice and pro-forma statement that the users would ideally like to receive. The objective was to find a way to reduce costs associated with billing and collection. The Group was also informed of existing ways and means to achieve the objective and it was noted that the objective could be achieved within existing institutional frameworks.

2.2.8 Accordingly, it was noted that this should also be a priority item on the NAT EFG work programme as it could provide benefits to all concerned. To this end, the NAT EFG would examine the pros and cons of the financial benefits of consolidated billing and collection. The Group noted that the NAT EFG would provide NAT SPG/39 with either a progress report or a recommendation on this matter.

Differentiation of air navigation charges

2.2.9 In reviewing developments concerning the use of differential charging mechanisms to encourage the implementation of new Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) systems, the Group noted that the NAT EFG would develop criteria for incentive management based on ICAO policies on charges. In this connection, it was further noted that the issue of incentive management of charging mechanisms would be brought to the attention of the forthcoming Air Navigation Services Economics Panel (ANSEP) meeting by the NAT EFG Members that participate in the ANSEP.

The future work of the Group

2.2.10 The Group endorsed the following priority items on the NAT EFG work programme:

a) examination of cost allocation methods which will lead to the development of benchmarking and the development of performance indicators;
b) simplify the billing and collection system;
c) develop best practices leading to incentive management; and
d) address issues related to HF regression.

Change in chairmanship

2.2.11 The Group was informed that the Member from Denmark wished to stand down as the Chairman. He had also indicated that Denmark would not be in a position to continue to chair the NAT EFG. The Group expressed their sincere appreciation to Denmark and in particular to Mr Keld Ludvigsen for the outstanding job that he had done in steering the NAT EFG through its first years of existence. The Secretary of the NAT EFG wished to express his personal thanks to Mr Ludvigsen. The Member for Denmark was requested to convey the above sentiments.

2.2.12 The Group accepted with appreciation the offer of Ireland to assume the Chairmanship of the NAT EFG. In this connection, the Member for Ireland informed that Group that Mr Denis Daly, the Irish Member of the NAT EFG, would take on this responsibility.

2.3 North Atlantic Traffic Forecasting Group report

2.3.1 The Group noted that the 33rd Meeting of the NAT TFG had been held at the EUR/NAT Office of ICAO, from 7 to 16 May 2002. The NAT TFG's task was to update its forecast for the short and medium term (2002-2007) and long-term to 2015. A further requirement to this year's update was to incorporate the impact of the 11 September 2001 terrorist attacks in the United States on both the short-term and long-term outlook. To this end, the NAT TFG had prepared monthly estimates of passengers and flights covering the last three years in addition to annual passenger and flight information for 2001 to use as the base period in preparing its annual forecasts. This task was made possible by using several not necessarily compatible data sources including data from IATA, annual statistics from the NAT TFG members and Eurocontrol.

Highlight of forecasts

2.3.2 The NAT TFG revised its previous estimates of passenger and aircraft movements covering the period 1990 to 2000. During this review, new sources of information including IATA's passenger traffic data series between Europe and the Caribbean/Central America and counts of air cargo aircraft movements were incorporated. As a result the historical number of passengers and flights crossing the ICAO North Atlantic region were found to be significantly higher than previously anticipated.

2.3.3 The Group was informed that an essential first step during an aviation forecasting exercise is to review the performance of the previous forecasts and to establish the continuing appropriateness of the assumptions. However, because of the data revisions and the significant traffic dislocation during the second half of 2001 and the early part of 2002, the previous short-term forecast prepared during the 32nd Meeting (2000) and reviewed during an interim meeting (2001) proved to be too much at variance with the current outlook and significantly outside the NAT TFG's previous forecast range to be of relevance.

2.3.4 The Group noted that it was expected that by the end of 2003, passenger and flight activities will return to levels experienced during 2000 as a result of strong economic growth and a consumer confidence recovery. In this connection, annual passenger and aircraft movement forecasts were prepared

for the six-year period 2002-2007. The medium-term forecast for the number of passengers was 78.3 million in 2005 and 86.1 million in 2007. The base line forecast for 2005 was approximately 16.3 percent lower than that put forward in 2001. The medium-term forecast for the number of aircraft movements was 432,700 in 2005 and 463,500 movements in 2007. The base line forecast for 2005 was 7.4 percent lower than that put forward in 2001. However, as outlined above, the data revision makes it difficult to establish any valuable comparison between the two forecasts. The average annual growth rates between 2001 and 2007 for passengers and flights are expected to be 5.0 percent and 3.9 percent respectively.

2.3.5 For the pessimistic medium-term scenario, the average annual growth rates between 2001 and 2007 for passengers and flights are 3.6 percent and 2.6 percent respectively. For the optimistic case, the equivalent figures are 6.2 percent annually for passengers and 5.0 percent annually for aircraft movements.

2.3.6 Annual passenger and aircraft movement forecasts were also prepared for the long-term period 2010-2015. The forecast for the number of passengers was 99.3 million in 2010 and 123.6 million in 2015. The forecast for the number of aircraft movements was 514,400 in 2010 and 605,600 movements in 2015. The average annual growth rates between 2001 and 2015 for passengers and flights are 4.8 percent and 3.6 percent respectively.

2.3.7 In the pessimistic long-term scenario, the average annual growth rates between 2001 and 2015 for passengers and flights are 3.5 percent and 2.3 percent respectively. For the optimistic case, the equivalent figures are 6.0 percent annually for passengers and 4.7 percent annually for aircraft movements.

2.3.8 The following tables provide an overview of the short, medium and long term forecasts:

LONG-TERM FORECASTS OF AIRCRAFT MOVEMENTS IN THE ICAO NORTH ATLANTIC REGION (THOUSANDS)

	ACTUAL		FORECAST			
SCENARIO	**2000R**	**2001e**	**2005**	**2007**	**2010**	**2015**
OPTIMISTIC			452.0	491.4	566.3	702.3
BASELINE	381.9	367.7	432.7	463.5	514.4	605.6
PESSIMISTIC			406.9	428.2	456.8	502.8

AVERAGE PERCENTAGE CHANGE IN AIRCRAFT MOVEMENTS PER ANNUM

	ACTUAL		FORECAST			
SCENARIO	**2000/99**	**2001/00**	**2005/01**	**2007/05**	**2010/07**	**2015/10**
OPTIMISTIC			5.3%	4.3%	4.8%	4.4%
BASELINE	4.6%	-3.7%	4.2%	3.5%	3.5%	3.3%
PESSIMISTIC			2.6%	2.6%	2.2%	1.9%

Shared area represents revised actuals/forecasts
e Estimate
R Revised

FORECASTS OF AIRCRAFT MOVEMENTS IN THE ICAO NORTH ATLANTIC REGION (THOUSANDS)

	ACTUAL							FORECAST					
SCENARIO	**1995R**	**1996R**	**1997R**	**1998R**	**1999R**	**2000R**	**2001e**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
OPTIMISTIC								369.9	411.7	435.0	452.0	469.1	491.4
BASELINE	281.5	302.8	313.9	338.4	365.0	381.9	367.7	364.2	397.5	416.8	432.7	448.3	463.5
PESSIMISTIC								351.7	372.4	392.3	406.9	419.8	428.2

ANNUAL PERCENTAGE CHANGE IN AIRCRAFT MOVEMENTS

	ACTUAL							FORECAST					
SCENARIO	**1996/95**	**1997/96**	**1998/97**	**1999/98**	**2000/99**	**2001/00**	**2001/95***	**2002/01**	**2003/02**	**2004/03**	**2005/04**	**2006/05**	**2007/06**
OPTIMISTIC								0.6%	11.3%	5.7%	3.9%	3.8%	4.8%
BASELINE	7.6%	3.7%	7.8%	7.9%	4.6%	-3.7%	4.6%	-1.0%	9.1%	4.9%	3.8%	3.6%	3.4%
PESSIMISTIC								-4.4%	5.9%	5.3%	3.7%	3.2%	2.0%

e Estimate

* Average annual percentage growth rate

R Revised

Highlight of issues raised

2.3.9 The Group was informed that, for the most part, the data problems raised at both the 31st (May 1998-Paris) and 32nd (May 2000-Montreal) meetings appear to have been resolved at the NAT TFG's interim meeting held in Washington DC in March 2001. Nevertheless, it was pointed out that the lack of New York centre data could result in some understatement of Mid-Atlantic/Caribbean flights. The NAT TFG was of the opinion that all flights in this traffic region should be reported by the Santa Maria centre.

2.3.10 The Group was also informed that New York centre failed to respond to either the July or November sample periods. Since the New York centre is the sole handler of traffic flow between New York Oceanic Control Area (OCA) and the CAR region, the Group decided that it would not prepare forecasts for this traffic region at its 33rd meeting. Whether the Group prepares forecasts for this traffic flow in future years will depend largely on the data needs/requirements of the NAT SPG and/or whether a reliable alternative source of flight data can be found for this traffic region. The Member for the United States agreed to look into this matter and to inform the Secretary of the results of his enquiries.

Editorial Note: It had been subsequently found that New York Centre had collected the data but that the NAT TFG had not received it. This has been rectified and the NAT TFG will endeavour to incorporate it as an addendum in their next report.

2.3.11 The Group noted the request from the NAT TFG to the NAT SPG to specify who uses the busy hour forecasts and to explain for what purpose and how these forecasts are used. It was pointed out that the production of the busy hour forecasts was time-consuming (approximately 25 % of their time), and the NAT TFG was anxious that it uses the limited time at its disposal to best effect. The Group indicated that the busy hour forecasts would be very useful in planning sector manning; however, the current presentation made the forecasts difficult to fully exploit. It was also pointed out that busy hour forecasts could be very useful when sizing new systems.

2.3.12 In a similar vein, the NAT TFG requested the NAT SPG for a description of the uses made of its aircraft type forecasts. As with the busy hour forecasts, the production of the aircraft type forecasts was time-consuming, and the NAT TFG was concerned that it may not be producing the most appropriate sets of forecasts and that the aircraft type splits may not be adequate for their intended use. The NAT TFG was considering an overhaul of the models it uses in the production of the aircraft type forecasts, and would welcome an early response on this issue. The Group agreed that the current forecasts do not provide the type of information needed for planning purposes. It was more important to know the avionics suite rather than the aircraft type itself. However, since in many cases the aircraft type predicts equipage, it was agreed that a more detailed grouping of aircraft types would be desirable.

CONCLUSION 38/8 - NEED FOR NEW AIRCRAFT TYPE FORECASTS

That, the North Atlantic Traffic Forecasting Group, in close co-ordination with other NAT teams engaged in similar activities, explore ways to predict in detail the future aircraft type mix.

2.3.13 In concluding its review of the report of NAT TFG/33, the Group expressed their appreciation for the quality of the product. It was also recognised that the forecasts developed by the NAT TFG were very important planning tools for the NAT Region in that many different stakeholders used them. With this in mind, the Group agreed to stress the importance that the NAT TFG meet at least once every two years.

CONCLUSION 38/9 - NEED FOR BI-ANNUAL NORTH ATLANTIC TRAFFIC FORECASTING GROUP (NAT TFG) MEETINGS

That, NAT SPG Members co-ordinate within their administrations to ensure that the NAT TFG meets at least once every two years in order to keep the NAT forecasts as up to date as possible.

3. AIR NAVIGATION SYSTEM REVIEW

3.1 Review of system safety performance

SCRUTINY MATTERS [1]

Lateral navigation performance accuracy achieved in the NAT Region during the period 1 January 2001 to 31 December 2001

3.1.1 The Group noted a decrease (10%) in the number of errors in Minimum Navigation Performance Specifications (MNPS) airspace compared with the previous 12 month period . It also noted that the overall numbers of gross navigation errors (GNEs) in the NAT Region as a whole had decreased by four (12%) compared with the last period. Overall, the effect of the reported GNEs in 2001 produced a reduction in the estimated risk compared with 2000. Even taking into account the 2.7% decrease in traffic during 2001 compared with 2000, there had been a significant reduction in lateral risk.

3.1.2 In accordance with monitoring procedures, follow-up action was taken by the Central Monitoring Agency (CMA) for all reported errors in excess of 50 NM. The Group noted that this only had to be undertaken for 7 of 11 reported occurrences.

3.1.3 Using flights per GNE as a generic measure of the lateral navigation performance, overall performance in 2001, was notably better than for 2000 for public transport operations but significantly worse for both International General Aviation (IGA) and military aircraft. In regard to GNEs committed by military operators, the Group noted that the FAA representative on the Scrutiny Group was in direct communication with Air Mobility Command and was suggesting procedures that could be adopted to help reduce the frequency of GNEs.

3.1.4 The Group considered the part played by OACs in containing the number of gross navigation errors through timely intervention to prevent incorrect routing. During the monitoring period, Gander and Shanwick OACs advised the CMA of 79 (81 in 2000) occasions when action had been taken to prevent a GNE. The Group noted that this was around the same number reported during the previous 12-month period. The following information was extracted from the available data:

a) 64 (61)* cases of crew or probable crew error;
b) 13 (17)* cases thought to be attributable to Air Traffic Control (ATC) error; and
c) 2 (3) from causes not able to be determined.

* 2000 figures

3.1.5 It was noted that the overall numbers of interventions was similar to the previous reporting year and that crew "blunder" error was still the biggest factor in ATC having to intervene to prevent a GNE.

[1] For the detailed discussions and analysis of lateral navigation performance, reference should be made to the report of the Scrutiny Group which had been presented to NAT SPG/38 and which is available on request from the EUR/NAT Office of ICAO

Of particular note was that five of the interventions were made following data received from FANS equipped aircraft.

3.1.6 With respect to the continued application of the 10 minutes longitudinal separation, it was noted that the CMA had received three reports of erosions of longitudinal separation in excess of 3 minutes during the monitoring year compared to four in the previous year.

Methods of Improving the Observed Standard of Navigation Performance

3.1.7 In considering the methods whereby the observed standard of navigation performance might be improved, account was taken of the lessons derived from the review of navigation performance. As a general observation, the Group noted that New York had not reported lateral or vertical deviations to the CMA. This had been a feature for many years despite persistent requests for reports to be provided. Santa Maria had reported to the CMA but the CMA had not received data in a useable format until May 2002. This meant that it was not possible to include it neither in the Scrutiny Group report nor in the formal risk assessment. The Group re-iterated its previous position that all data needed to carry out the safety analysis should always be provided to the CMA by e-mail or fax on the day of the incident or as soon as practicable thereafter. Additionally, the Group agreed that service providers should endeavour to transmit to the CMA flight plans and Radio Telephony (R/T) transcripts along with the report of a GNE; this would help the Scrutiny Group to analyse the cause of the incident more easily.

3.1.8 As in previous years, a very high number of the GNEs had been caused by pilot error following a re-route. The Group was disappointed to note that while the total number of GNEs in MNPS airspace was less than the previous year, a significant number involved glass cockpit aircraft. The Group concluded that in the instances where GNEs had occurred, some could have been prevented if the crew had transmitted the position reports directly from the Flight Management System (FMS) progress or report pages and not from the paper flight log or AIREP reporting form. By reporting directly from the FMS progress page, any transcription error would most likely be noticed by ATC and an intervention to prevent a GNE would be made. Furthermore, had the crews involved used track and distance tables, they may have realised that they had entered incorrect data into the FMS.

3.1.9 Considering that the above issues had been raised and discussed at previous NAT SPG meetings, it was agreed that the EUR/NAT Office of ICAO should be requested to send a State Letter highlighting the points raised by the Scrutiny Group in order to enhance awareness of the problems and their effects on the level of risk in the system.

3.1.10 The Group noted that two errors could have been prevented by ATC had the controller on each occasion during the intervention process, confirmed the clearance with the pilot rather than asking the pilot to confirm his routing. This would have ensured the pilot was made aware of the correct routing more quickly thus preventing a major track deviation.

3.1.11 One GNE was caused by a crew using a track message that had the correct track message identifier number on it for the day of operation but the incorrect validity date (for the previous day) and hence the wrong tracks. Notwithstanding how this came about, had the pilot checked the validity date of the track message, he/she should have noted the incorrect date.

3.1.12 Finally, like last year, in the course of its scrutiny the Group noted that where Gander ACC would use its radar coverage of oceanic airspace to prevent GNEs, the same was not always the case in Reykjavik ACC.

CONCLUSION 38/10 - THE NEED TO ADDRESS OPERATIONAL MATTERS THAT AFFECT SAFETY IN THE SYSTEM

That:

a) the European and North Atlantic (EUR/NAT) Office of ICAO be requested to circulate a State Letter in order to raise awareness of the effects that operational errors or omissions by pilots have on the level of risk in the NAT system; and

b) States take the following action:

i) inform controllers that if they note that the subsequent position reported after the present position is in contradiction to the cleared routing, he/she should immediately confirm the cleared route to the crew without first asking for confirmation of the given position report; and

ii) Area Control Centres endeavour to transmit to the Central Monitoring Agency appropriate transcripts when reporting action for a gross navigation error or altitude deviation of 300 ft or more.

Vertical navigation performance accuracy achieved in the NAT Region during the period 1 January 2001 to 31 December 2001.

3.1.13 The Group noted that the altitude deviations of 300 ft or more received by the CMA had been scrutinized in an attempt to establish any trends in the operation of aircraft in the NAT Region, which had led to operational errors in the vertical dimension.

3.1.14 The CMA had gathered 25 reports of risk bearing altitude deviations in MNPS airspace. Turbulence or aircraft technical problems caused four of these deviations, while the remaining 21 were attributable to crew or ATC actions. The Group was encouraged to note that not one of these was risk bearing as a result of the failure of a crew to follow the correct contingency procedures following emergency cockpit procedures.

3.1.15 During the course of the scrutiny, it was noted that the major causes of the risk bearing errors were attributable to the following:

a) failure of domestic ATC providers to clear aircraft to climb to their cleared oceanic level;

b) aircraft entering the ocean at a lower level than cleared on the grounds that the crew were unable to achieve the cleared level;

c) crews mis-interpreting an acknowledgement by the radio operator of a request to climb as a clearance to climb; and

d) break down in co-ordination between Shanwick and Reykjavik.

3.1.16 One of the Group's major concerns was the high incidence of entry into oceanic airspace at the incorrect level. It was noted that the Scrutiny Group had concluded that both the pilot and the controller had responsibility to ensure that the aircraft was at the correct level to enter the ocean i.e. the level included in the oceanic clearance.

3.1.17 Another point worthy of note was that, like last year, the Group felt that errors could have been prevented had pilots been reminded by controllers to report leaving and reaching a level and to include this in the readback. While this was done in the Shanwick and Reykjavik FIRs, it was thought not to be the case in the Gander FIR. As regards the co-ordination problems between Reykjavik and Shanwick, this

should be improved when new software is installed at Shanwick in July 2002. The Group agreed that the Operations Managers should address these issues. In agreeing to the foregoing, it was understood that coordination would be carried out with domestic ACCs. Finally, the Group recalled NAT SPG Conclusion 37/12, which had given the NAT IMG the remit to address ATM issues identified by the Scrutiny Group, and agreed that the Conclusion was still extant.

CONCLUSION 38/11 - PROCEDURES TO REDUCE RISK DUE TO OPERATIONAL ERRORS

That, the NAT Implementation Management Group address the following issues and report to NAT SPG/39:

a) crews be made aware of the need to request domestic Air Traffic Control (ATC) for a climb to the cleared oceanic level and to not enter the ocean at any level other than the cleared level; and

b) all controllers remind pilots to "report leaving and reaching" when cleared to a new level.

Methods of Improving the Current Monitoring Procedures

3.1.18 The Group concluded that the current monitoring methods were adequate to allow GNEs and altitude deviations to be investigated effectively but repeated its annual plea to all concerned to ensure that all OACs report deviations and erosions of longitudinal separation to the NAT CMA are in line with NAT SPG directives and in accordance with the procedures detailed in NAT Doc 001. Specifically, it considered it very important for the CMA to receive reports from New York and Santa Maria.

Review of the minimum height monitoring (technical) requirements for NAT RVSM airspace.

3.1.19 Following a meeting of the "three Regional Monitoring Agencies" in February 2002, it was proposed that the NAT should step into line with the EUR Region and abandon its policy to require monitoring prior to the award of RVSM approval. The Group was reminded that this was in line with the view of ICAO's Separation and Airspace Safety Panel.

3.1.20 In this connection, it was recalled that no requirement for monitoring to obtain an RVSM approval was contained in the ICAO Guidance Material. The reason that the NAT Region took the decision in 1996 to adopt the policy of making monitoring a pre-requisite for approval was because of the lack of monitoring data. If the requirement had not been adopted, the implementation of RVSM would have been delayed. It was also recalled that the basic premise for RVSM approval is that an aircraft meets the MASPS. Monitoring was required to ensure that the MASPS were indeed functioning as designed. This objective has been met and the CMA now has sufficiently large amounts of monitoring data to confirm the efficacy of the MASPS.

3.1.21 The Group noted that no strong arguments on the grounds of safety were presented and the general opinion was that it was both impractical and potentially confusing for operators to have different monitoring requirements for adjacent regions. Therefore, the Group agreed that the monitoring programme for the NAT be in line with that used in the EUR Region.

CONCLUSION 38/12 - MONITORING PROGRAMME FOR THE NAT

That, the requirement to height monitor Minimum Aircraft System Performance Specification (MASPS) compliant aircraft prior to the award of an RVSM approval be removed.

MATHEMATICAL MATTERS

2001 LATERAL AND VERTICAL COLLISION RISK ESTIMATES

Lateral

3.1.22 The lateral risk and occupancy estimates were based on the full 12 months of 2001. Until further significant changes in airspace structure, the risk will continue to be assessed on a calendar year basis. However, because of the effect on traffic levels of the terrorist attacks of September 11, 2001, special allowance was made for this when calculating the occupancy values for that year.

3.1.23 The Group determined the lateral occupancy estimates for 2001 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 30°W estimates. The estimates were based on data for the 4th and 15th days of each month except for the 15th September: data for that day was not included in the estimates since the low traffic levels would not have been reflective of the typical traffic levels throughout the year. The 2001 estimates together with the estimates for the previous four monitoring years are shown in Table 1.

Table 1: Lateral Occupancy Estimates for the years from 1997 to 2001

		Monitoring Year						
Direction	**Traffic**	**1997 Pre-RVSM**	**1997/98 RVSM Phase 1 ⊕**	**1998 RVSM Phase 1**	**1998/99 RVSM Phase 2 ***	**1999 RVSM Phase 2**	**2000 RVSM Phase 2**	**2001 RVSM Phase 2**
Same	**OTS**	1.479	1.098	1.151	0.818	0.959	0.996	1.008
	Random	0.282	0.204	0.222	0.156	0.173	0.165	0.174
	Comb	1.032	0.752	0.802	0.567	0.671	0.702	0.716
Opposite	**OTS**	0.004	0.003	0.002	0.003	0.004	0.005	0.002
	Random	0.013	0.008	0.007	0.008	0.010	0.012	0.006
	Comb	0.007	0.005	0.004	0.005	0.006	0.007	0.003

⊕ 9 month occupancy period
* 7 month occupancy period

3.1.24 Both the Organized Track System (OTS) and random (and hence also the combined) same direction occupancy values have increased since the previous year (2000) but are still lower than their pre-RVSM values of 1997. The opposite direction occupancies usually show little detectable trend because of the small number of aircraft involved. The opposite direction values for 2001 are lower than 2000 and are the lowest values since 1997. Because opposite direction occupancy estimates are sensitive to small changes in the number of such proximate pairs, the effect of a known anomaly in the Gander Automated Air Traffic System (GAATS) (in its method of updating flight level records) on this occupancy value was investigated. It was agreed that counting anomalies could reasonably be ignored in the opposite direction calculation and it was stated that a modification to GAATS was expected to clear the anomaly.

3.1.25 It was noted that the total NAT traffic for 2001 had been estimated to have decreased by approximately 3% from that of the year 2000. This seemed at first sight to be at odds with the increase in same direction occupancy. The effect on occupancy of traffic reduction in the NAT was likely to have produced a smaller than expected change due to the reductions being seen principally outside of the "core" traffic; that traffic which exists outside of the typical travel times and away from the central OTS routes. Another contributing factor may have been due to the fact that the overall reduction in NAT traffic came from the major fall off in traffic after the events of September 2001, whereas the greatest contribution to the

occupancy came from the peak traffic levels of the summer months. Traffic levels for the summer months of 2001 (except for July) were in fact higher than those in the corresponding months of 2000.

3.1.26 It was agreed by NAT SPG/37 that, in future, the error weights for lateral GNEs should be reviewed each year by the MWG using the latest occupancy estimates. A recommendation to update the weights would then be made as required. Based on the occupancy estimates for 2001 it was found that there was no need to update the error weights from those adopted at NAT SPG/36. They will continue to be reviewed annually.

3.1.27 Table 2 details the weighted gross navigation errors used in preparing the risk estimate with table 3 providing the weighted risk bearing rates since 1997.

Table 2: 2001 Weighted Gross Navigation Errors

Class	> 30 NM	Risk bearing	OTS	Random	Comb
A	0	0	0.00	0.00	0.00
B	0	0	0.00	0.00	0.00
C1	0	0	0.00	0.00	0.00
C2	5	4	0.00	1.32	1.32
C3	1	1	0.00	0.33	0.33
D	0	0	0.00	0.00	0.00
E	0	0	0.00	0.00	0.00
F	1	0	0.00	0.00	0.00
Unknown	0	0	0.00	0.00	0.00
Total	7	5	0.00	1.65	1.65
Sample Traffic Count			176695	134794	311489
Error Rate	**x10-4**		**0.00**	**0.12**	**0.05**

Table 3: Weighted Risk-Bearing Error Rates (x 10^{-4}) for the years from 1997 to 2001

Sample	1997	1998	1999	2000	2001
OTS	0.00	0.06	0.03	0.00	**0.00**
Random	0.45	0.31	0.21	0.20	**0.12**
Comb	0.18	0.17	0.10	0.08	**0.05**

3.1.28 The 2001 lateral collision risk estimates together with the estimates for the previous four monitoring years are shown in Table 4. Compared to previous years it can be seen that the overall collision risk estimate for all MNPS traffic has decreased and is in fact the lowest risk during that period. The estimated risk for Random traffic has also decreased while the calculated values for traffic on the OTS have remained constant at zero. All the estimates for 2001 are below the Target Level of Safety (TLS) of 20 x 10^{-9} fatal accidents per flight hour.

3.1.29 As pointed out above, revised values for the average dimensions of NAT aircraft have been used for this year's risk estimate, based on a traffic sample gathered during 2001. The values have increased slightly for each dimension and this will be reflected in a slightly higher risk estimate than would have been obtained otherwise. During the discussion on aircraft dimensions it emerged that there was evidence that the NAT fleet composition was changing rapidly. The Group speculated that this was due to the withdrawal

from service of older, non-ADS equipped types following the downturn in traffic, and the replacement of smaller extended range operations of twin-engined aeroplanes (ETOPS) aircraft with newer models of larger dimension. Because of this it was agreed that the revised aircraft size parameters should be regarded as interim only and that a new set of parameters should be derived from a new sample in time for NAT SPG/39.

CONCLUSION 38/13 - DEVELOP NEW VALUES FOR AIRCRAFT SIZE PARAMETERS

That, new values for the average aircraft size parameters be estimated by the Mathematicians Working Group for the risk assessments for NAT SPG/39.

Table 4: Lateral Risk Estimates for the years from 1997 to 2001

All figures are in fatal accidents per flight hour and should be multiplied by 10^{-9}.
These should be compared against the TLS of 20 x 10^{-9}.

	Monitoring Year						
	1997 Pre-RVSM	**1997 RVSM Phase 1 ⊕**	**1998 RVSM Phase 1**	**1998 RVSM Phase 2 ***	**1999 RVSM Phase 2**	**2000 RVSM Phase 2**	**2001 RVSM Phase 2**
OTS	0.0	0.0	4.5	3.3	1.6	0.0	0.0
Random	12.5	8.7	5.7	4.5	3.4	3.4	1.8
All MNPS	6.2	4.3	5.0	3.8	2.4	1.5	0.9

⊕ 9 month occupancy period
* 7 month occupancy period

3.1.30 It had been suggested at NAT SPG/37 that a twelve month sample period for the OTS tracks might not allow an accurate estimate of the system risk to be calculated. For the past two monitoring periods the calculated value of this risk had been estimated to be zero. It was known that the true risk in the system could not be identically zero. Furthermore, there was evidence of the occurrence of errors in the OTS which were not included in the current risk estimate. For this reason and in accordance with NAT SPG Conclusion 37/15, the sampling period for GNEs had been extended, as part of a feasibility study, to cover the RVSM Phase II period from October 1998 to December 2001. It was agreed that a suitable sampling period should now be determined taking account of the full implementation of RVSM. The current lateral risk estimates using the extended sample period are shown in Table 5.

Table 5: Lateral Risk Estimates Using Three Year GNE Sample Period

Traffic Type	**Total MNPS Count**	**Risk x 10^{-9}**
OTS	599095	0.52
Random	501648	2.46
All MNPS	1100743	1.40

CONCLUSION 38/14 - DETERMINATION OF A SUITABLE SAMPLING PERIOD FOR LATERAL RISK ESTIMATES

That, further studies be carried out by the Mathematicians Working Group to determine a suitable sampling period for lateral risk estimates.

3.1.31 During the Group discussions on the lateral risk model a number of points emerged that the Group felt should be studied further:

a) the implication of the observation that the random risk is 5 times that for the OTS, while the traffic levels were comparable over the 3 year period, was difficult to explain. However, it was noted that aircraft on OTS tracks formed well defined sub-sets of the NAT traffic whereas random tracks were not so well defined since they could be identical to OTS tracks except for one waypoint. In such cases, what were really OTS risk bearing events would be classified as random - the OTS may not be as 'safe' as it appeared. On the other hand, some random tracks cross the OTS at high angles, with a different potential impact on risk;

b) during the Scrutiny Group discussion, it emerged that GNEs in which an aircraft diverged from its cleared track and followed a curved path, perhaps completing a full 360° turn or more, would probably not occur at the sampling window. That is, the risk associated with such mid-Ocean events would not be accurately represented in the risk estimates. There may be other types of mid-Ocean error that would not be adequately sampled at the window;

c) it was known that one of the potential problems associated with any use in risk estimates of GNEs outside of the sampling window was the possibility of under-reporting. This could lead to risk estimates that were lower than the true risk. Nevertheless, the risk information contained in errors actually reported from outside of the 'window' was being lost. It was felt that better use should be made of this data if an appropriate way could be found to incorporate these errors into the sampling method. The increasing equipage of the NAT fleet with datalink systems potentially makes the capture of such errors more complete and reliable.

3.1.32 In view of the above, it was agreed that the current lateral risk estimation methodology should be reviewed, with the aim of identifying improvements that would result in more complete risk estimates. At the same time new data sources in addition to the reports collated by the CMA should be sought out.

CONCLUSION 38/15 - REVIEW OF THE LATERAL RISK ESTIMATION METHODOLOGY

That, the current lateral risk estimation methodology be reviewed by the Mathematicians' Working Group.

Vertical

3.1.33 As for lateral occupancies, the Group determined the vertical occupancy estimates for the 12 months of 2001 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 30°W estimates. The estimates were based on data for the 4th and 15th days of each month except that for the 15th September which was omitted on the basis that it was not representative of the traffic either before or after 11 September 2001. The 2001 estimates together with estimates since 1998, for both RVSM and non-RVSM levels, are shown in Table 6.

Table 6: Vertical Occupancy Estimates for the years from 1998 to 2001

		RVSM levels				Non-RVSM levels			
Direction	**Traffic**	**1998**	**1999**	**2000**	**2001**	**1998**	**1999**	**2000**	**2001**
Same	**OTS**	1.153	1.324	1.303	1.283	0.051	0.039	0.050	0.066
	Random	0.133	0.143	0.165	0.160	0.035	0.035	0.057	0.062
	Comb	0.795	0.921	0.928	0.914	0.046	0.037	0.054	0.064
Opposite	**OTS**	0.001	0.002	0.002	0.001	0.015	0.014	0.015	0.006
	Random	0.033	0.032	0.027	0.029	0.022	0.021	0.025	0.013
	Comb	0.013	0.012	0.010	0.010	0.018	0.018	0.020	0.009

Risk Due to Operational Errors

3.1.34 The operational element of vertical collision risk, in both RVSM and non-RVSM environments, was determined from the estimate of time spent by aircraft at uncleared levels or when incorrectly cleared to a level and, additionally, for uncleared level changes, the number of levels crossed without clearance during the monitoring year. Table 7 shows the total number of (not necessarily risk bearing) large height deviations (LHD) reported to the CMA and the estimate of time spent at uncleared levels for 2001 and the previous five monitoring years. It was noted again that no reports of LHDs were obtained from the New York OAC. This has particular implications with respect to WATRS where New York OAC is the only reporting facility. The seriousness of this situation was also discussed during the Scrutiny Group meeting, particularly in light of the fact that previous indications were that the frequent use of conditional clearances in New York OCA had led to a significant number of large height deviations in that airspace.

Table 7: Large Height Deviations and Time Spent at Wrong Levels for the Years 1996 - 2001

	1996	**1997 (pre RVSM)[1]**	**1997 (RVSM Ph 1) [2]**	**1998 (RVSM Ph 1)[3]**	**1998 (RVSM Ph 2)[4]**	**1999 (RVSM Ph 2)**	**2000 (RVSM Ph 2)**	**2001 (RVSM Ph 2)**
Number of Deviations	49	24	56	62	7	52	31	**41**
Time at Wrong Level (mins)	182	83	266	60.2	10	170	52	**159**

1: Collection period from January to March 1997.
2: Collection period from April to December 1997.
3: Collection period from January to 7 October 1998.
4: Collection period from 8 October to December 1998.

3.1.35 As with the lateral errors, the large height deviations reported to the CMA during 2001 were examined in conjunction with the Scrutiny Group to agree the classification for risk calculation purposes. Table 7 shows that there had been an increase in the time spent at un-cleared levels and the number of deviations reported. Nevertheless, there still appeared to be considerable fluctuations in the times.

3.1.36 Based on the set of large height deviations reported in 2001 the Group determined the operational vertical collision risk estimates. The estimates are shown in Table 8 together with, for comparison, the estimates under RVSM Phase 2 operations since 1998. As noted above revised (interim) values for average aircraft dimensions have been used for the risk calculations.

Table 8: Vertical Collision Risk Estimates between 1998 and 2001
(Large Height Deviations Only)

All Figures are in Fatal Accidents Per Flight Hour and should be Multiplied by 10^{-9}.
Bold figures are the risk estimates for 2001.

	RVSM Levels				non-RVSM Levels			
	1998*	**1999****	**2000**	**2001**	**1998***	**1999****	**2000**	**2001**
OTS	0.8	6.0	0.51	**3.03**	0.1	0.0	0.043	**0.0**
Random	6.1	8.9	6.59	**16.27**	1.9	4.4	0.0	**0.38**
Combined	3.2	7.2	3.04	**8.97**	1.2	2.5	0.018	**0.22**
TLS	5.0	5.0	5.0	5.0	20.0	20.0	20.0	20.0

*: 1998 values estimated for Phase 2 RVSM between October and December using 12 months LHD data.
**: Figures in parenthesis are the risks under the revised $P_y(0)$ used from 2000 onwards.

3.1.37 Table 8 shows that the random and combined vertical collision risk due to operational errors at RVSM levels for the year 2001 is above the TLS. The collision risk in the vertical dimension has now exceeded the TLS for 2 out of the last 4 years. Despite the fluctuation in the annual risk estimates it can be concluded that the operational risk is above the TLS.

3.1.38 No specific source appeared to be the main contributor to the risk estimate for 2001. Instead, the large time spent at uncleared levels was an accumulation of time from several events. The main causes of the errors were reported by the Scrutiny Group.

3.1.39 While viewing this situation with concern, the Group was satisfied that its initiative for the NAT Region wide adoption of the proposed offset procedures would bring the estimated risk, due to the currently observed vertical error rate, well within the TLS (paragraph 2.1.9 refers).

3.1.40 The risk for non-RVSM levels was considerably lower than that for RVSM levels since only two such levels were available in MNPS airspace in 2001, one below and one above RVSM levels and the occupancies for those levels were low. In addition, there were very few risk bearing events reported for these levels. The risk for non-RVSM levels was well within the TLS for those levels of 20×10^{-9}.

3.1.41 The Group noted that 2001 was the final year for which vertical collision risk at non-RVSM levels would be estimated. Phase II RVSM ceased on 24 January 2002, when the remaining two non-RVSM levels became RVSM levels and two new RVSM levels were created (FL300 and 400). It was not proposed that the risk at non-RVSM levels for January 2002 be calculated. It was also recommended that the occupancies for 2002 be estimated using only data from the 11 months from February to December based on a common range of RVSM flight levels. For the risk estimate, the errors occurring during the full calendar year would be included.

WATRS RVSM Risk Assessment

3.1.42 Following NAT SPG Conclusion 37/4 e), the Group noted that work had commenced on assessing the vertical collision risk in the WATRS. However, it had been impossible to carry out this work on this occasion due to the total lack of information from New York OAC on operational errors within the WATRS. It was noted that discussions had been held with the CMA with the aim of developing ways of obtaining the required information.

3.1.43 It was stressed that without a post implementation risk assessment for the WATRS area there is no basis from which to conclude that the operation is safe.

3.1.44 It had been possible to carry out a preliminary investigation of the application of lateral offsets in the region by making use of the radar coverage from Bermuda. As well as developing a useful technique for determining whether aircraft were flying offsets, it had also been possible to estimate the core distribution of aircraft around their intended track. The indications were that:

a) only a small percentage of crews appeared to be applying strategic lateral offsets according to the recommended procedure to date during the trial in the WATRS. This was significant from a risk perspective since uni-directional lateral offsets were seen as the most effective way of reducing collision risk in the traffic environment of the WATRS (a high proportion of opposite direction traffic);

b) the radar data indicated that the distribution of aircraft about track centreline was tighter than recorded in other Oceanic airspaces leading to a conclusion that a higher percentage of aircraft were equipped with and using Global Navigation Satellite System (GNSS) than initially anticipated. As a result, the risk of vertical collision would be exceedingly high without the routine use of strategic lateral offsets. This implied a parallel increase in collision risk in the NAT. One possible reason for the increase in Py(0) was the preferential removal by operators of older non-GPS equipped aircraft from the fleet, following the downturn in traffic post September 2001. Again, it was assumed a similar situation applied in the NAT;

c) in addition, extraordinary means were undertaken to assure that flight crews were aware of the strategic lateral offsets operational trial, its correct application and the reason for its implementation in the WATRS.

Technical Risk

3.1.45 In accordance with NAT SPG Conclusion 37/18 the use of monitoring data from other sources, in particular Eurocontrol, had been under consideration. In order to make use of the Eurocontrol Altimetry System Error (ASE) monitoring data in technical risk estimates however, it was necessary that the risk estimation software be capable of handling the large amounts of data available. To this end, software developed by the FAA for the NAT risk monitoring programme had been compared with software developed by Eurocontrol for processing its ASE data. The FAA software was limited in the amount of data it could process and the FAA had offered to modify and re-compile the software to address current limitations.

3.1.46 The study revealed that there were small differences in the results of calculations of the two software packages, even when identical data sets were processed (hence the differences in output were due entirely to the software). Because of this, it was agreed that further work should be carried out by running the two software packages in parallel for some period to evaluate their performance benefits and understand any differences between them. It was suggested that progress could be made by communicating by e-mail on the matter rather than waiting for the next MWG meeting. Furthermore, it was recommended that the methods for processing ASE data be reviewed, in particular to take into account the effect of the MASPS requirement for the carriage and continuous cross monitoring of two independent primary altimetry systems. Finally it was noted that there might be proprietary or other legal considerations associated with using the Eurocontrol software for NAT risk estimation, and that these should be looked into.

3.1.47 An estimate of Pz(1000) had been made using NAT ASE data and the Eurocontrol software. It was agreed that the value produced would not be adopted as the current value yet, bearing in mind the matters still to be addressed with the software. Nevertheless the work involved was of value since it highlighted other areas for consideration. In particular, it was felt that a new assigned altitude deviation

(AAD) distribution should be produced by observing a current sample of traffic. It was anticipated that this distribution would have changed in the years since the last observations of 1996/7 since more pilots were flying at RVSM levels and had greater familiarity with the procedures.

CONCLUSION 38/16 - STUDY TO DETERMINE THE DISTRIBUTION OF ASSIGNED ALTITUDE DEVIATION (AAD)

That, a new study be carried out by the NAT Implementation Management Group to determine the current AAD distribution of NAT traffic for technical risk assessment purposes.

Lateral Overlap Probability

3.1.48 $P_y(0)$ is an important factor in both the technical and operational risk. Since the agreed value of $P_y(0)$ already exceeded that used in the NAT regional implementation of RVSM by a factor of 2, and since it appeared to be continuing to rise (together with the vertical collision risk), the Group felt that $P_y(0)$ should be re-estimated.

3.1.49 Lateral offsets were being trialled in the WATRS as one method that appeared to be a workable method of reducing the value of $P_y(0)$ and hence the vertical collision risk. The Mathematicians Working Group recommended that the NAT SPG give serious consideration to the application of a tactical lateral offsets in the NAT to similarly counter the effects of the increasing $P_y(0)$ (paragraph 2.1.9 refers).

CONCLUSION 38/17 - RE-ESTIMATE THE VALUE OF P_y (0) FOR THE NAT REGION

That $P_y(0)$ be re-estimated by the NAT Implementation Management Group for application in the NAT Region.

REVIEW OF ON-GOING MONITORING PROCEDURES

Vertical

Review of the Minimum Monitoring Requirements Table

3.1.50 A review of the aircraft types in Group 3 of the minimum monitoring requirements table for the NAT was carried out. The aim of the review was to indicate if any of the aircraft types in that group had exhibited ASE performance sufficient to warrant their move to Category 1 in the NAT minimum monitoring table. Based on the ASE mean and standard deviation, it was agreed in principle that some aircraft types could be moved to a higher category. It was noted that the final configuration of the Minimum Monitoring Requirements table will be discussed at the forthcoming SASP meeting.

3.1.51 The possible value of ASE data from other monitoring agencies was considered during the discussions, particularly with reference to some aircraft types that are seldom, if ever, seen by the NAT Height Monitoring Units (HMUs). Such data may be used to verify that an aircraft type's performance was unsatisfactory, or indeed the converse.

3.1.52 The observer from the Russian Federation requested that, in conjunction with the CMA, the possibility of adding specific Russian built aircraft types to the minimum monitoring chart be explored. The Group noted that the Secretary would bring this to the attention of the CMA.

ASE Stability Studies

3.1.53 An underlying assumption of the MASPS was that ASE was stable over time. In accordance with NAT SPG Conclusion 37/17, a new investigation of ASE stability, incorporating the latest available ASE data, has been carried out. ASE measurements on 83 of the most frequently observed aircraft at the Strumble Production HMU were examined. For the aircraft studied, the ASE data encompassed the period 14 May 1998 to 26 March 2002. It was concluded that 33 out of the 83 aircraft observed had shown a shift in ASE mean over that period, at a confidence level of 99%. For some aircraft there was evidence of a gradual drift in ASE mean, for others there appeared to be sudden shifts in ASE mean. The maximum shift observed was one of -56ft. To determine the impact of this on the technical risk at RVSM levels some further work was required, particularly on the causes of such ASE shifts. It was noted that some of the aircraft have ASE means, which have shifted from some positive value to near zero, which was an improvement in performance. The Group concluded that the most useful next step would be to obtain the maintenance records of at least one, but preferably many, of the sampled airframes. The aim of this would be to attempt to correlate ASE mean shift with any relevant changes to the aircraft and to relate that to the MASPS. Further work could also be carried out statistically on the data available, including examining the frequency of aberrant measurements (or specified large measurements) through time, which could help to set ASE mean shift limits for the sampled population of aircraft. In this connection the Group agreed that the studies agreed to by NAT SPG Conclusion 37/17 were still valid. In this connection, the Group noted that the NAT IMG had tasked its working groups to address this matter.

CONCLUSION 38/18 - STUDIES TO DETERMINE THE STABILITY OF ALTIMETRY SYSTEM ERROR (ASE)

That, the NAT Implementation Management Group continue its studies to determine the stability of ASE.

3.1.54 Related to studies of ASE measurements and their errors, a study was reported, which compared the performance of the United Kingdom Bracknell weather model, in predicting flight level heights, with that of the United States National Oceanic and Atmospheric Administration (NOAA) weather model. Initial indications were that there were systematic differences between the two models. It should be noted however that the work so far had shown that both models appeared to be suitable for predicting flight level height. Further work would be carried out in this area.

Future risk level predictions for the NAT

3.1.55 For the information of the NAT SPG, a study into the future risk levels expected in the NAT Region, based on current GNE and other error rates, was reported. Its general conclusions were that lateral offsets were required in order to reduce the vertical collision risk. As is reported above, the lateral collision risk was currently well below its TLS. Bearing in mind that future traffic predictions were of course fraught with difficulty, the study nevertheless implied that in the long term some means of reducing the number of both lateral and vertical errors would be required in order to bring the risk down below the TLS.

3.2 Review of system operations

AIR TRAFFIC MANAGEMENT

North Atlantic Operations Managers' Meeting

3.2.1 The Group was informed that, because of the events of 11 September 2001, the NAT Operations Managers Meeting had to be postponed until March 2002. For this reason, no report to the NAT SPG had been made available. The Group regretted this situation and recalled that this had arisen in the past. In this connection, the Group recalled Conclusion 34/14 which stated that the rapporteur of the NAT

Operations Managers should submit a report to the Secretary within thirty days of the end of the meeting. The Group also recalled the working methods contained in the NAT SPG Handbook related to the NAT Operations Managers. In particular, reference was made to the need to limit reports to the NAT SPG to issues that were relevant to the NAT SPG. With this in mind, all NAT SPG Members concerned were requested to remind the Operations Manager from their facilities of the NAT SPG requirements.

COMMUNICATIONS

Aeronautical Communications Sub-Group (ACSG)

3.2.2 The Group reviewed the report of the fourth meeting of the ACSG that had been held in Shannon, Ireland on 10 and 11 December 2001. The primary purpose of the Meeting had been to address the HF family allocation, Optimisation of the HF family utilization and to prepare and propose procedural changes for the consideration by the NAT SPG.

3.2.3 The Group agreed that, in order to improve utilisation of staff resources, frequency management needed to be done tactically, predicated on available frequencies and traffic flows. This would therefore require new principles for network management.

CONCLUSION 38/19 - PRINCIPLES FOR HIGH FREQUENCY (HF) NETWORK MANAGEMENT

That:

a) radio stations in the NAT Region monitor only those frequencies that were useable at any given time of the day;

b) the HF Guidance Material be made available for HF ground station operators; and

c) the Guidance Material be reviewed by the Operations Managers to determine any necessary further action.

3.2.4 With respect to traffic analysis, it was noted that traffic had grown by 3.46% a year between 1990 and 2000 and that this growth had been achieved within the existing infrastructure, which was at capacity during peak periods, therefore requiring a more effective management of resources. The Group noted the intention of the ACSG to discontinue the Table "4th and 15 Day" of the Data Consolidation, since no relevant information could be obtained from it and that the busiest day report be changed to a single day analysis within a three-month period. This could be changed in the future to a six-month period if this was found to be sufficient.

3.2.5 The Group was advised that all stations in the NAT Region have ceased using the Intercept Procedure described in ICAO guidelines, except for New York. The general consensus of the Group was that communications efficiencies in the NAT Region had improved to the point whereby the intercept procedures were no longer required. Recalling NAT SPG Conclusion 35/22, the Group therefore agreed that the practice should be discontinued throughout the NAT Region and that this be indicated in the relevant national AIPs.

CONCLUSION 38/20 - DISCONTINUATION OF USING THE INTERCEPT PROCEDURES

That, States Providing services in the NAT Region cease using the ICAO Intercept Procedures and that this information be published in national Aeronautical Information Publications.

3.2.6 The Group confirmed that, with respect to the practice of SELCAL checks and Read-backs, the procedures were to be retained.

3.2.7 The Group noted the intention of the ACSG to hold meetings at least every two years. This was to facilitate the development of regional management planning. The meetings would be held near radio station facilities in order to facilitate site visits and the exchange of operational experience. Taking into account that major changes were being experienced throughout the NAT Region, and especially to HF operations, it was agreed that the ACSG hold its next meeting prior to NAT SPG/39.

3.2.8 In concluding its review of the report of the ACSG, the Group noted that the ACSG had been almost completely renewed. The Group expressed its appreciation for the work that had been carried out, especially the support that had been given to the NAT IMG concerning HF regression.

SYSTEM EFFICIENCY

3.2.9 The Group was presented with the ATS system efficiency assessment for Gander ACC for 2001. In this connection, the Group recalled its previous discussion on this matter and noted that this information should be provided to the NAT IMG in order to assist them in developing operational performance indicators.

4. DOCUMENTATION UPDATE

4.1 NAT Documentation review

4.1.1 The Group was provided with an update of the status of NAT documentation. The Seventh Edition of the NAT Guidance Material had been finalised and had been posted on the NAT SPG web site (www.nat-pco.org). The Group noted that the MNPS Operations Manual needed updating to reflect the latest changes to the Air Navigation Services (ANS) system. It was noted that the International General Aviation (IGA) Manual had been handed on to the NAT OPS Managers and that it would be reviewed and updated by July 2002. The Group agreed that the MNPS Operations Manual should be updated as soon as possible.

4.1.2 As regards the NAT Air Navigation Plan (ANP) and the NAT Facilities and Services Implementation Document (FASID), the Group noted that they had been approved by the Council almost a decade ago and thus required review in order to make them applicable as today's baseline documents and bring them into line with the ICAO Council decisions concerning the new ANPs and FASIDs. In this connection, the Group was provided with the latest update concerning Air Navigation Commission (ANC) decisions relating to ANPs and FASIDs. In particular, it was noted that NAT SPG developments would be added to the work in progress concerning regional developments. The Group agreed that there was an urgent need to update these documents, especially once the concept of operations has been approved. The Group agreed that ICAO should endeavour to finalise an amendment to the two documents so that they can be presented to NAT SPG/39 for endorsement.

CONCLUSION 38/21 - UPDATING NORTH ATLANTIC (NAT) REGIONAL DOCUMENTATION

That:

a) ICAO be requested to make arrangements to update the NAT Air Navigation Plan (ANP) and Facilities and Services Implementation Document (FASID);

b) the draft changes be presented to NAT SPG/39 for endorsement; and

c) the editors of the Minimum Navigation Performance Specifications (MNPS) Operations Manual arrange to update the document, taking account of recent changes, by March 2003.

4.1.3 The Group was reminded that Assembly Resolution A33-16 concerning the Global Aviation Safety Plan (GASP) should be used as one of the tools to reduce worldwide accidents. In this connection, the Group was informed that in accordance with operative clause 15 of Resolution A33-16, the ICAO GASP had been distributed to States under cover of State Letter AN 6/37-02/11 of 31 January 2002 and that it has been posted on the ICAO web site.

NAT SPG Handbook

4.1.4 The Group was informed that the NAT SPG Handbook had been revised to take account of the revised NAT SPG structure, including the establishment of the NAT EFG, and that a new edition had been published.

5. ANY OTHER BUSINESS

5.1 Farewells

5.1.1 At the opening of the Meeting, the Chairman informed the Group that Mr Ommund Mydland, the Member for Norway, was attending his last meeting. Ommund had been a regular contributor to the NAT SPG since NAT SPG/30 in 1994. Ommund's knowledge of the ICAO processes will be missed.

5.1.2 In addition to Ommund, the Chairman also informed the Group that its doyen, Mr Alan Gilbert from IATA, had left his post as Director of Infrastructure for the NAT and NAM regions. Alan had started at NAT SPG/24 in 1987. His knowledge and experience, especially in the area of safety management will be missed.

5.1.3 The Group wished Ommund and Alan all the best in their future endeavours.

5.2 Next meeting

5.2.1 The Group agreed that NAT SPG/39 be held in the EUR/NAT Office of ICAO, from 17 to 19 June 2003. Considering the benefit of starting the meeting on Tuesday, the same procedure will be applied for the next meeting.

APPENDIX A
LIST OF PARTICIPANTS

(Paragraph i.4 refers)

CANADA
unable to attend*

DENMARK/DANEMARK
Mr Lars Peter JENSEN *
Mr Kurt ANDREASEN

FRANCE
Mr André BERMAN*****
Mr Kamel REBAI

ICELAND/ISLANDE
Mr Asgeir PALSSON*
Mr Leifur HAKONARSON

IRELAND/IRLANDE
Mr Patrick RYAN*

NORWAY/NORVÈGE
Mr Ommund MYDLAND*

PORTUGAL
Mr Carlos MONTEIRO*
Mr Jose Joaquim CABRAL
Mr Cirilo ARAUJO
Mr Luis F. RODRIGUES

RUSSIAN FEDERATION/
FÉDÉRATION DE RUSSIE
Mr Victor STEBLEVETS
Mr Vitali TANDOURA
Mr Vicheslav MOSASHVILI

SPAIN/ESPAGNE
Mr Antonio AGUSTI GUERRERO

UNITED KINGDOM/ROYAUME-UNI
Mr George BALLANTYNE*
Mr Jim BENSON #
Mr David NICHOLAS
Mr Keith SLATER

UNITED STATES OF AMERICA/
ÉTATS UNIS D'AMÉRIQUE
Mr Gerry L. RICHARD**
Mr David MALOY

International Organizations/Organisations internationales

IATA
Mr Alan R.L. GILBERT
Mr John WHITE
Mr David STRAND

IBAC
Mr Peter INGLETON

IFALPA
Mr Madison WALTON

IFATCA
Mr Eddie WALLACE

* Member/Membre ** Alternate Member/Membre suppléant #Part-time/à temps partiel

APPENDIX B
SPECIAL PROCEDURES FOR LATERAL OFFSETS WITHIN NAT AIRSPACE

(Paragraph 2.1.9 refers)

European and North Atlantic Office

PROPOSAL FOR AMENDMENT OF THE ICAO REGIONAL SUPPLEMENTARY PROCEDURES (DOC 7030)

(Serial No.: EUR/NAT-S 01/36 – NAT RAC/14)

a) Regional Supplementary Procedures:

Doc 7030/4 - NAT, Part 1, Rules of the Air, Air Traffic Services and Search and Rescue, incorporating Amendment No 203.

b) Proposed by:

The United States of America

c) Proposed amendment:

Replace in entirety the wording contained in paragraph 7.5 "Special procedures to mitigate wake turbulence encounters in the NAT region".

7.5 Special procedures for lateral offsets within NAT airspace

Note: The following incorporates lateral offset procedures for both the mitigation of the increasing lateral overlap probability and wake turbulence encounters.

7.5.1 It has been determined that allowing aircraft conducting oceanic flight to fly lateral offsets not to exceed 2 NM right of centerline will provide additional safety margin and mitigate the risk of conflict when non-normal events such as aircraft navigation errors, height deviation errors and turbulence induced altitude-keeping errors occur.

7.5.2 This procedure provides for offsets within the following guidelines. Along a route or track there will be three positions that an aircraft may fly: centreline or one or two miles right. Offsets will not exceed 2 NM right of centreline. The intent of this procedure is to reduce risk (add safety margin) by distributing aircraft laterally across the three available positions.

a) Aircraft without automatic offset programming capability must fly the centreline.

b) Operators capable of programming automatic offsets may fly the centreline or offset one or two nautical miles right of centerline to obtain lateral spacing from nearby aircraft. (Offsets will not exceed 2 NM right of centerline). An aircraft overtaking another aircraft should offset within the confines of this procedure, if capable, so as to create the least amount of wake turbulence for the aircraft being overtaken.

c) Pilots should use whatever means is available to determine the best flight path to fly.

d) Pilots should also fly one of the three positions shown above to avoid wake turbulence. Aircraft should not offset to the left of centreline nor offset more than 2 NM right of centreline. Pilots may contact other aircraft on frequency 123.45, as necessary; to coordinate the best wake turbulence offset option.

Note: It is recognized that the pilot will use his/her judgement to determine the action most appropriate to any given situation and has the final authority and responsibility for the safe operations of the aeroplane

e) Pilots may apply an offset outbound at the oceanic entry point and must return to centerline at the oceanic exit point.

f) Aircraft transiting oceanic radar areas may remain on their established offset positions.

g) There is no ATC clearance required for this procedure and it is not necessary that ATC be advised.

d) Proposer's reason for amendment:

e) Proposed implementation date of the amendment:

As soon as practicable after approval by Council.

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

g) Secretariat comments:

The proposal for amendment was endorsed by NAT SPG/38 – Conclusion 38/4 refers.

APPENDIX C
AIRCRAFT OBSERVATIONS AND REPORTS

(Paragraph 2.1.11 refers)

European and North Atlantic Office

PROPOSAL FOR AMENDMENT OF THE ICAO REGIONAL SUPPLEMENTARY PROCEDURES (DOC 7030/4)

(Serial No.: EUR/NAT-S 01/33-NAT MET/12)

a) **Regional Supplementary Procedures:**

Doc 7030/4 – NAT, Part 3, MET as modified by Amendment 203 dated 20 February 2002.

b) **Proposed Amendment:**

Amend NAT, Part 3 - Meteorology as follows:

1.0	**AIRCRAFT OBSERVATIONS AND REPORTS** (A3 – Chapter 5)

Editorial Note: — No recording is required for any routine aircraft observations (provisions related to post-flight reporting have been deleted). Sub-paragraph 3) is redundant as the provision has been included in Annex 3 as 5.4.6 a).

1.1 When voice communications are used, ~~A~~all aircraft flying in the Bodø Oceanic, Søndrestrøm, Reykjavik, Gander Oceanic, Shanwick Oceanic, New York Oceanic and Santa Maria Oceanic flight information regions between North America and Europe in either direction shall be required to make~~, record~~ and report routine meteorological observations at each designated reporting point and at the intermediate mid-point between such reporting points, except that:

1) the mid-point observation shall not be the subject of a separate report but will be retained for transmission at the next designated reporting point; and

2) aircraft cleared on an organized track shall be required to make~~, record~~ and report routine observations only when so designated at the time of receiving their oceanic clearance in accordance with SUPPS-RAC 4.4.2 and 6.1~~; and~~

~~3) aircraft which are not equipped with area navigation (RNAV) equipment shall be exempted from making routine reports.~~

Editorial Note: — Paragraph 1.2 is redundant as the details of the format to be used has been included in Appendix 1 of the PANS-ATM (Doc 4444).

1.2 When voice communications are used, t~~T~~he format to be used for ~~the reporting of the additional observations shall be by reference to the latitude (degrees and minutes) and longitude (degrees only) for the intermediate mid-point. The use of the term MID is insufficient for direct input into MET computers~~ all aircraft reports shall be in accordance with Appendix 1 to Procedures for Air Navigation Services — Rules of the Air and Air Traffic Services (PANS-ATM, Doc 4444).

Editorial Note: — The present SUPPs apply only to voice reports. The text of the proposed new paragraph is to provide procedures to obtain the requisite number of MET reports when using data links for position reporting.

1.3 When air-ground data link is used for ATC purposes, the following requirements shall apply:

a) aircraft using data link for position reporting are exempt from all routine voice Meteorological (wind and temperature) reporting; and

b) the appropriate ATS Providers shall determine, in consultation with their respective MET Authorities, MET reporting requirements for aircraft using data link for position reporting.

c) **Originated by:**

Secretary General

d) **Originator's reason for amendment:**

Consequential action as a result of Council adopting Amendment 70 to Annex 3 to take account of automated air reporting.

e) **Intended date of implementation:**

As soon as possible after approval by the Council.

f) **Proposal circulated to the following States and organisations:**

g) **Secretariat's comments:**

See editorial notes.

LIST OF ACRONYMS

AAD	assigned altitude deviation
ACARS	Aircraft Communication Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
ACAS II	Airborne Collision Avoidance System – Phase 2
ACC	Area Control Centre
ACSG	Aeronautical Communications Sub-Group
ADS	Automatic Dependent Surveillance
AFI	African
AFTN	Aeronautical Fixed Telecommunications Network
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
ALLPIRG	All Planning and Implementation Regional Groups
AMSS	Aeronautical Mobile-Satellite Service
ANP	Air Navigation Plan
ASE	Altimetry System Error
ATC	Air Traffic Control
ATM	Air Traffic Management
ATMG	Air Traffic Management Group
ATMIP	Air Traffic Management Implementation Plan
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Services
BOTA	Brest Oceanic Transition Area
CAA	Civil Aviation Authority
CADAG	Communications, Automation and Data Link Applications Group
CADS	Central Automatic Dependent Surveillance
CAR	Caribbean
CMA	Central Monitoring Agency
CNS	Communications
CNS/ATM	Communications, Navigation and Surveillance/Air Traffic Management
CPDLC	Controller Pilot Data Link Communications
CRM	Collision Risk Model
CTA	Control Area
EATCHIP	European Air Traffic Control Harmonization and Integration Programme
ECAC	European Civil Aviation Conference
EFG	Economic and Financial Group
EGNOS	European Geostationary Navigation Overlay Service
ELT	Emergency Locator Transmitter
EUR	European
EUR/NAT	European and North Atlantic
FAA	Federal Aviation Administration
FANS	Future Air Navigation Systems
FASID	Facilities and Services Implementation Document
FCMA	FANS Central Monitoring Agency
FDE	Fault Detection and Exclusion
FDPS	Flight Data Processing System
FIG	FANS 1/A Implementation Group
FIR	Flight Information Region
FIS	Flight Information Services
FMS	Flight Management System
FTE	Flight Technical Error
GAATS	Gander Automated Air Traffic System
GAT	General Air Traffic

GLONASS	Global Orbiting Navigation Satellite System
GMS	Global Positioning System Monitoring System
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
HFDL	HF Data Link
HMS	Height Monitoring System
HMU	Height Monitoring Unit
IACA	International Air Carrier Association
IAOPA	International Council of Aircraft Owner and Pilot Associations
IATA	International Air Transport Association
IBAC	International Business Aviation Council
ICD	Interface Control Document
IFALPA	International Federation of Air Line Pilots' Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
IGA	International General Aviation
Inmarsat	International Maritime Satellite Organization
INS	Inertial Navigation System
IOC	International Oceanic Conference
IRS	Inertial Reference System
ITASPS	ICAO Informal Trans-Asia/Trans-Siberia/Cross Polar Routes High Level Steering Group
ITU	International Telecommunications Union
JAA	Joint Aviation Authorities
LHD	Large Height Deviation
LIM NAT RAN	Limited North Atlantic Regional Air Navigation
MASPS	Minimum Aircraft System Performance Specification
MEL	Minimum Equipment List
MIG	Mathematicians Implementation Group
MNPS OPS	Minimum Navigation Performance Specifications Operations
MNPS	Minimum Navigation Performance Specifications
MOPS	Minimum Operational Performance Standards
MNT	Mach Number Technique
MSSR	Monopulse Secondary Surveillance Radar
MWG	Mathematicians Working Group
NAM	North American
NAT EFG	North Atlantic Economic and Financial Group
NAT IMG	North Atlantic Implementation Management Group
NAT SPG	North Atlantic Systems Planning Group
NAT TFG	North Atlantic Traffic Forecasting Group
NAT	North Atlantic
NICE Group	NAT Implementation Management Cost Effectiveness Group
NOAA	National Oceanic and Atmospheric Administration
OAC	Oceanic Area Control Centre
OCA	Oceanic Control Area
OCD	Oceanic Clearance Delivery
ODAPS	Oceanic Display and Planning System
OLDI	On Line Data Interchange
OPS MNG	NAT Operations Managers
OPS/AIR	Operations/Airworthiness
OTS	Organized Track System
PCO	Programme Co-ordination Office
R&D	Research and Development
R/T	Radio Telecommunication
RAIM	Receiver Autonomous Integrity Monitoring
RHSM	Reduced Horizontal Separation Minima

RMA	Regional Monitoring Agency
RNAV	Area Navigation
RNP	Required Navigation Performance
RSSIG	Reduced Separation Standards Implementation Group
RTCA	Radio Technical Commission for Aeronautics
RVSM	Reduced Vertical Separation Minimum
SAR	Search and Rescue
SARPS	Standards and Recommended Practices (ICAO)
SATCOM	Satellite Communications
SOTA	Shannon Oceanic Transition Area
SSR	Secondary Surveillance Radar
SST	Supersonic Transport
SUPPS	Regional Supplementary Procedures
TA	Traffic Advisors
TCAS	Traffic Alert and Collision Avoidance System
TIBA	Traffic Information Broadcast by Aircraft
TLS	Target Level of Safety
TOR	Terms of Reference
TVE	Total Vertical Error
UIR	Upper Information Region
VHF	Very High Frequency
WAAS	Wide Area Augmentation System
WATRS	West Atlantic Route System
WGS-84	World Geodetic System – 1984 Standards
WPR	Waypoint Position Report
WWW	World Wide Web

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