NAT SPG/35

Summary of Discussions and Conclusions of the

Thirty-Fifth Meeting of the

North Atlantic Systems Planning Group

Paris, 14 to 17 June 1999

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FOREWORD

i. Introduction

i.1 The Thirty-Fifth Meeting of the North Atlantic Systems Planning Group (NAT SPG) was held in the European and North Atlantic (EUR/NAT) Office of ICAO from 14 to 17 June 1999.

i.2 In it's opening session, the Group unanimously elected Mr Ásgeir Pálsson, the Member from Iceland, as the Chairman of the NAT SPG. In doing so, the Group expressed its sincere appreciation to Mr Myles Murphy from the Irish Civil Aviation Authority for his outstanding work not only as the Chairman of the NAT SPG but also as a valued participant in the work of the Group.

i.3 In addition to the International Air Carriers Association (IACA), the International Air Transport Association (IATA), 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), the Group had, as usual, invited the Russian Federation and Spain to attend the meeting as observers. A list of participants is at page 3.

i.4 The Mathematicians' Working Group (MWG) had met in the EUR/NAT Office of ICAO from 7 to 11 June 1999 to consider the mathematical and statistical aspects of the safety of separation minima in the NAT Region and to ensure that the Target Levels of Safety (TLS) was being met. **Mr Keith Slater** of the United Kingdom, the Rapporteur of the MWG, presented their report in support of the assessment of current system safety performance in terms of lateral, vertical and longitudinal collision risk.

i.5 The sub-group charged with the scrutiny of navigation performance in the NAT Region, which was chaired by **Mr Jim Benson** of the United Kingdom, had met in London on 27 April 1999, and had provided the NAT SPG with their report.

i.6 The Aeronautical Communications Sub Group (ACSG) had met in Reykjavik, Iceland, from 12 to 16 April 1999 and had reviewed matters related to the NAT aeronautical telecommunications infrastructure. **Mr Phonsie O'Connor** of Ireland, in his capacity of Rapporteur, provided the NAT SPG with their report.

i.7 The NAT Operations (OPS) Managers had met in Bodø, Norway, from 14 to 18 September 1998 and their report had been made available to the NAT SPG.

i.8 The NAT Implementation Management Group (NAT IMG) had met three times since NAT SPG/34 (paragraph 2.3.1 also refers).

i.9 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.10 Mr Christian Eigl, the Regional Director of the ICAO EUR/NAT Office and the Secretary of the NAT SPG welcomed the NAT SPG to the newly refurbished ICAO premises. Mr Jacques Vanier and Mr Robert Kruger from the ICAO EUR/NAT Office assisted him, as did Mr Jean-Claude Bugnet, Chief of the Joint Financing Section, from ICAO Headquarters.

i.11 In his opening remarks, Mr Pálsson welcomed Mr Don MacKeigan from Canada, Mr Kurt Andreasen, from Denmark, Mr Pat Ryan from Ireland and Mr Gerry Richard from the United States of America as new members.

i.12 The Chairman also requested that the new members pass on the best wishes of the Group to the out-going members, namely Mr Jack Butt from Canada, Mr Lars Peter Jensen from Denmark, Mr Myles Murphy from Ireland and Mr Chuck Reavis from the United States. The Group expressed their sincere appreciation for their contributions.

i.13 Mr Phonsie O'Connor informed the Group that he would no longer be able to act as the Rapporteur of the ACSG. The Group expressed their appreciation for the work he had carried out and wished him all the best in his future endeavours. With this decision in mind, the Group accepted Portugal's offer to nominate a Rapporteur of the ACSG.

LIST OF PARTICIPANTS

CANADA
Mr Don MacKEIGAN*
Mr John NAVAUX

DENMARK/DANEMARK
Mr Kurt ANDREASEN*
Mr Svend GRAVESEN
Mr Knud ROSING

FRANCE
Mr André BERMAN*
Mr Christian MARQUANT
Mr Jean-François GROUT
Mr Jean-Claude ALBERT

ICELAND/ISLANDE
Mr Ásgeir PÁLSSON*
Mr Leifur HAKONARSON
Mr Haukur HAUKSSON

IRELAND/IRLANDE
Mr Patrick RYAN*
Mr Phonsie O'CONNOR

NORWAY/NORVÈGE
Mr Ommund MYDLAND*
Mr Einar HAUGEN

PORTUGAL
Mr Carlos MONTEIRO*
Mr Joaquim CABRAL
Mr João COUTINHO
Mr Dinis RESENDES
Mr Luis RODRIGUES

RUSSIAN FEDERATION/
FÉDÉRATION DE RUSSIE
Mr Oleg TROUKHTANOV

SPAIN/ESPAGNE
Mr José Maria CURA

UNITED KINGDOM/ROYAUME UNI
Mr George ENNIS*
Mr Jim BENSON
Mr John NORDBØ
Mr Keith SLATER

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

IACA
Mr Helge Ingo FRANZ

IATA
Mr Alan GILBERT
Mr Paul FRANZ
Mr Guy GOSSEZ
Mr David STRAND
Mr Jerry WILMOT

IBAC
Mr Ron CHAFE
Mr Peter INGLETON

IFALPA
Mr Robert SWAIN

IFATCA
Mr Eddie WALLACE

INMARSAT
Mr Lindsay NORRISH

* NAT SPG Member

1. AGENDA ITEM 1 - DEVELOPMENTS

1.1 Introduction

1.1.1 Under this Agenda Item, the Group considered the following specific subjects:

a) ICAO Panels and Committees

b) Adjacent Regions

1.2 ICAO Panels and Committees

Report of the Third ALLPIRG Advisory Group Meeting (ALLPIRG/3)

1.2.1 The Group reviewed the report of ALLPIRG/3 and felt that all of the conclusions that had been developed by ALLPIRG/3 were being adequately addressed in the NAT Region and that mechanisms to deal with them were already in place. The NAT Region, being a relatively homogeneous airspace with homogeneous fleet combinations and homogeneous airplane equipage, made the task of implementing Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) less complex than in other Regions. Therefore, the NAT SPG felt that it was not necessary, at this time, to embark on any additional work relating to ALLPIRG conclusions; nevertheless the Group felt that it was necessary to follow with interest the developments in that forum and supply input when deemed necessary.

1.3 Adjacent Regions

European Region

1.3.1 The Group was informed that plans had now been developed and agreed to in order to implement Reduced Vertical Separation Minimum (RVSM) in the EUR Region on 24 January 2002. An amendment proposal specifying the area of application and the technical requirements had been circulated and it was in the last stages of being approved. It was noted that studies were being carried out to ascertain whether it would be possible to implement RVSM in some parts of the EUR Region prior to this date; however, these studies had only recently been initiated and no results were available. The Group noted that the NAT IMG would keep the implementation of RVSM in the EUR Region under review in order to determine when RVSM Phase 3 for the NAT Region should be implemented. In this connection, it was also noted that the implementation of NAT RVSM Phase 3 would also take account of the possible early implementation of RVSM in EUR Region States that are adjacent to the NAT Region.

1.3.2 As regards the mandatory carriage of Airborne Collision Avoidance System (ACAS) in areas that are adjacent to the NAT Region, it has been determined that it would not be possible to meet the 1 January 2000 date for various reasons. It was therefore intended to give exemptions up to March 2001, which is very close to the implementation date for ACAS in the NAT Region (January 1 2001). Accordingly, it was agreed that planning for the implementation of ACAS in the NAT Region should take into account ongoing planning activities in the EUR Region.

CONCLUSION 35/1 - PLANNING FOR THE IMPLEMENTATION OF AIRBORNE COLLISION AVOIDANCE SYSTEMS (ACAS) IN THE NAT REGION

That the NAT Implementation Management Group determine an ACAS implementation strategy taking account of on-going planning activities in the European Region.

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2. AGENDA ITEM 2 - PLANNING AND IMPLEMENTATION

2.1 Introduction

2.1.1 Under this Agenda Item, the Group considered the following specific subjects:

a) NAT Traffic Forecasting Group (NAT TFG) report

b) NAT IMG report

c) Implementation planning

d) Other issues

2.2 Report of the NAT Traffic Forecasting Group (NAT TFG)

2.2.1 The 31st meeting of the NAT TFG was held at the ICAO EUR/NAT Office in Paris from 2 to 10 June 1999. The Group's major task was to update the NAT annual and peak period forecasts for the 1999 – 2004 period and to update the long-term forecasts for 2005, 2010 and 2015. To this end the NAT TFG had prepared estimates of annual 1997 and 1998 passengers and flights. The 1998 figures were used as the base in preparing the annual forecasts. The NAT TFG had also revised its earlier estimate of 1996 passengers from 49.2 to 50.9 million and also its estimate of the number of aircraft movements from 279.0 to 281.8 thousand. The July and November 1998 sample data supplied by the Oceanic Area Control Centres (OACs) had served as a basis for the peak period forecasts.

2.2.2 Overall the forecast errors for 1997 and 1998, in respect to the number of passengers, confirmed that the base forecasts prepared at the 30th meeting had under-estimated the actual outcome. For the number of flights, the forecast for 1997 was within the range anticipated largely because of increasing load factors, but for 1998 the outcome was above the high forecast.

2.2.3 Recognizing the importance of traffic forecasts for planning purposes, the Group appreciated receiving the NAT TFG report and in particular the long-term forecast. Therefore, in connection with the NAT TFG's request for guidance, it was agreed that they should meet next year (2000) and thereafter every two years and that the long-term forecasts should be updated at every meeting.

CONCLUSION 35/2 - FREQUENCY OF MEETINGS OF THE NAT TRAFFIC FORECASTING GROUP (NAT TFG)

That the NAT TFG meet in 2000, prior to NAT SPG/36, and that they meet every two years thereafter.

2.2.4 The representative from IBAC indicated that Business Aviation continued to grow and that those operations at and above FL390 were significant. In view of the foregoing, it was agreed that International General Aviation (IGA) should participate more closely in the activities of the NAT TFG and that IBAC should co-ordinate more closely with the NAT TFG in order to provide them with information on Business Aviation activities.

CONCLUSION 35/3 - INFORMATION ON INTERNATIONAL GENERAL AVIATION (IGA) MOVEMENTS

That:

a) the International Business Aviation Council (IBAC) provide the NAT Traffic Forecasting Group (NAT TFG) with the results of their studies; and

b) Iceland and the United Kingdom provide information to IBAC so that they can carry out IGA related studies.

2.3 Report of the NAT Implementation Management Group

2.3.1 The NAT IMG had met three times since NAT SPG/34. The Air Traffic Management Group (ATMG) and the Mathematicians Implementation Group (MIG) had met twice. The Communications Automation and Data Link Applications Group (CADAG) had met once. The Reduced Separations Standards Implementation Group (RSSIG) had not met although its Operations and Airworthiness (OPS/AIR) sub group had met once. The reports of all the meetings were sent to all regular participants of the NAT SPG. In addition to the foregoing meetings, a special year 2000 (Y2K) meeting had been convened to develop a NAT Y2K contingency plan.

2.3.2 In accordance with the mandate given to the NAT IMG by the NAT SPG, a considerable amount of time was spent on ensuring that the implementation RVSM in Minimum Navigation Performance Specifications (MNPS) airspace was carried out in a safe and efficient manner. In addition, significant effort was spent on the development of a Future Air Navigation Systems (FANS 1/A) Implementation Plan, of a NAT Air Traffic Management (ATM) Concept of Operations, of a Y2K Contingency Plan and of managing the work of its contributory bodies.

Planning process and documentation

2.3.3 The NAT Programme Co-ordination Office (NAT PCO) web site is now up and running "http://www.nat-pco.org". A limited amount of documents are available on the site but several new ones will be added in the near future. The site will be improved in order to facilitate access to ICAO and NAT related documentation and will be used to provide information concerning the FANS 1/A Operational trials.

CONCLUSION 35/4 - ACCESS TO NAT DOCUMENTATION

That the ICAO European and North Atlantic Office inform all States and International Organizations concerned that documentation relating to Operations in the NAT Region can be obtained on the NAT Programme Co-ordination office web site address: http://www.nat-pco.org

The implementation of Reduced Vertical Separation Minimum

2.3.4 The NAT SPG MWG provided the latest risk assessment concerning the implementation of RVSM. The NAT IMG was pleased to note the results of the risk assessment that had been carried out by the NAT MIG in April 1999. Noting that the risk has been within acceptable boundaries and considering NAT SPG Conclusion 34/5, it was agreed that monitoring risk in the vertical plane should revert to the MWG.

CONCLUSION 35/5 - MONITORING RISK IN THE VERTICAL PLANE IN REDUCED VERTICAL SEPARATION MINIMUM (RVSM) AIRSPACE

That the NAT SPG Mathematicians Working Group undertake to monitor and report on the risk in the vertical plane in RVSM airspace.

2.3.5 It would appear from the risk assessment that some of the measures implemented in follow up to NAT SPG Conclusion 34/3 have helped to reduce the risk due to operational errors. Furthermore, it was agreed that the United Kingdom, on behalf of the NAT SPG, produce a video that highlighted this matter and stressed the importance of being vigilant in order to avoid operational errors. The costs associated with the production of the video would be borne through the Central Monitoring Agency's (CMA) budget which is recoverable through the RVSM financing mechanism.

CONCLUSION 35/6 - PRODUCTION OF A VIDEO HIGHLIGHTING THE IMPORTANCE OF BEING VIGILANT TO AVOID OPERATIONAL ERRORS

That:

a) the United Kingdom be requested to develop a video highlighting the importance of being vigilant in order to avoid operational errors;

b) the video take into account the type of errors that do occur in cockpits and the ways to prevent them; and

c) the costs of producing the video be recovered through the Central Monitoring Agency budget using the Reduced Vertical Separation Minimum (RVSM) financing mechanism.

RVSM Financial Considerations

2.3.6 Both production Height Monitoring Units (HMU) are operational although some upgrades were necessary. The financial arrangements have been operating without difficulty. However, as regards the future role of the Global Positioning System (GPS) Monitoring Units (GMU), the Group noted that the NAT IMG had decided to examine this matter in the context of the implementation of RVSM in the West Atlantic Route System (WATRS) and other parts of the NAT Region. Accordingly, it was agreed that NAT SPG Conclusion 34/7 was still valid and provided the NAT IMG sufficient leeway to carry out this task. The Group was provided with an update on the cost sharing/recovery mechanism for the height monitoring system.

NAT IMG Cost Effectiveness (NICE) programme

2.3.7 It was noted that NAT IMG/14 had examined the latest draft NICE report. It was also noted that the three modelled ATM improvements (up to and including Reduced Vertical and Horizontal Separation Minima (RVHSM)) envisaged for the NAT Region were likely to bring about a total fuel burn saving of between 0.8% in 1996 and 1.2% in 2010. The largest contribution to this fuel saving was likely to come from the implementation of full RVSM. Modelling had shown this initiative to save between 0.5% of total fuel in 1996 and 0.9% of total fuel in 2010, compared to the pre-RVSM baseline scenario. Further fuel savings, over RVSM, are shown to be approximately 0.1% of total fuel for Reduced Vertical and Longitudinal Separation Minima (RVLSM) and 0.3% of total fuel for Reduced Vertical and Horizontal Separation Minima (RVHSM).

2.3.8 As a result of the success of RVSM, the financial benefits of the ATM Implementation Plan (ATMIP) could not now be realised within the planned timeframes to 2015. Accordingly, the NAT IMG instituted a medium term plan up to 2005 which would address FANS 1/A accommodation, RVSM Phase 3 and RHSM Phases 1 and 2 (reductions in horizontal separation). Work on the ATM Implementation Plan to 2015 would be reintroduced when the NICE results were available but, in the interim, changes to the NAT IMG working structure and to the ATMIP may be required.

2.3.9 The Group was presented with a proposal concerning the future of the NICE programme. In this connection, it was noted that the NICE programme not only provided the NAT IMG with a tool for estimating fuel burn reductions for various scenarios, it had also accumulated valuable resources that could be used for other types of analysis. The United Kingdom and the United States both indicated that they would maintain their models. With this in mind, the Group agreed to recommend that the NICE programme should be continued for at least one more year and that it should be used to validate the estimates that have been made.

2.3.10 The Group noted that the cost of continued participation of Iceland in the NICE work had to be recovered through the Denmark/Iceland (Den/Ice) Joint Financing Agreements. The estimated cost for the Icelandic Civil Aviation Administration (CAA) was US $ 250 000 per annum.

2.3.11 The Group reviewed a proposal to extend the NICE programme until the end of 2000. Considering the importance of the programme to the NAT planning machinery and considering that the programme would provide long-term benefits to the NAT Region, it was agreed that the programme be extended by one year and that this decision would be reviewed at NAT SPG/36.

CONCLUSION 35/7 - CONTINUATION OF THE NAT IMPLEMENTATION COST EFFECTIVENESS (NICE) PROGRAMME

That:

a) the NICE programme be continued until the end of 2000; and

b) the requirement to continue this programme be reviewed at NAT SPG/36.

FANS 1/A Operational trials

2.3.12 The Group noted that the NAT IMG had developed a FANS 1/A Operational Trial Implementation Plan for the NAT Region. The plan was based on the use of FANS 1/A by equipped aircraft that were operating in the NAT Region. Operators were not compelled to participate in the trials nor was it intended to make FANS 1/A mandatory. The main benefit to be derived was the experience that would be gained from the use of this data link technology. The trials were scheduled to begin on 15 July 1999. Canada, Ireland and the United Kingdom would be involved in the initial trial which specifically addressed FANS 1/A Automatic Dependent Surveillance (ADS) Waypoint Position Reporting (WPR).

2.3.13 The United States indicated they would not be able to participate in FANS 1/A ADS WPR trials because of operational and financial issues that needed to be resolved. However, they intended to implement Controller Pilot Data Link Communications (CPDLC) in New York OAC in the fall of 1999. It was agreed that this was consistent with the NAT SPG policy regarding the accommodation of FANS 1/A. The Group also recognized the hurdles that the United States needed to overcome to be able to participate in the FANS 1/A ADS WPR trials and expressed their wish that the United States would join the trials as soon as possible in order to have a region wide application.

2.3.14 During the discussions, several issues had been identified that would need to be addressed. The first related to the need to establish a mechanism to monitor and oversee the trials. The second related to funding and cost recovery considerations. To this end, a meeting of financial experts will be convened in the second half of 1999 to address this matter. The third issue related to the future provision of High Frequency (HF) communications (NAT SPG Conclusion 34/15 also refers). Finally, legal and liability issues would have to be clarified and addressed. The NAT IMG will examine these matters and NAT SPG/36 will be provided with an update.

CONCLUSION 35/8 - DEVELOPMENT OF POLICY RELATED TO THE FUTURE AIR NAVIGATION SYSTEMS (FANS 1/A) OPERATIONAL TRIALS

That, in the context of the FANS 1/A Operational trials, the NAT Implementation Management Group:

a) facilitate the development of policy by provider States regarding financial and legal issues;

b) develop a method to monitor the trials;

c) develop proposals for the future provision of High Frequency (HF) services in the NAT Region; and

d) provide NAT SPG/36 with a progress report.

2.3.15 In addition to the above, consideration will be given to the implementation of other FANS 1/A functionalities.

Formation flights in RVSM airspace

2.3.16 In follow up to NAT SPG Conclusion 32/8, the question of formation flights in RVSM airspace was examined and in particular the ones involving C17 type aircraft. These aircraft operate in pairs in trail and are both RVSM approved. On the basis of this information, a study had been carried out to identify the risk caused by these types of operations. The results of the study had indicated that these flights did not introduce a significant additional risk at the current number of operations per year and therefore no additional separation was required. However, it was felt that a monitoring method needed to be introduced to take account of C17 operations. The NAT IMG proposed to ensure the development of such a monitoring mechanism. On this basis, the NAT OPS Managers were requested to develop a tracking and reporting mechanism and the NAT IMG were requested to develop appropriate parameters for a monitoring mechanism.

CONCLUSION 35/9 - C17 FORMATION FLIGHTS IN REDUCED VERTICAL SEPARATION MINIMUM (RVSM) AIRSPACE

That:

a) the NAT Implementation Management Group develop appropriate parameters for a monitoring mechanism to accommodate C17 formation flights in RVSM airspace; and

b) NAT Operations Managers develop a tracking and reporting mechanism for the above.

The implementation of 8.33 kHz Channel spacing radios in the EUR Region

2.3.17 The Group noted the study that has been carried out by the NAT IMG on the implications that the implementation of 8.33 kHz Channel spacing radios in the EUR Region would have on NAT traffic. On the basis of the information gathered, the Group endorsed the position that the transition should not take place in the NAT Region. In this connection, it was stressed that there was no requirement for 8.33 kHz Channel spacing radios in the NAT Region and to carry out the transition task in the NAT Region would have a serious effect on NAT users. Nevertheless, the Group realized that the implementation of 8.33 kHz Channel spacing radios would take place on 7 October 1999. The Group had been informed that France had undertaken the task of developing procedures, in co-ordination with Shannon and Shanwick, to handle traffic originating from the NAT Region and entering Brest Flight Information Region (FIR).

2.3.18 The Group recognized that, as a result of the implementation of 8.33 kHz Channel spacing radios in the EUR Region, a breakdown in inter-regional co-ordination appeared to have happened. It was therefore stressed that more vigilance was required in the future when implementing CNS/ATM systems, especially as regards interfaces. This activity should be co-ordinated under the auspices of ICAO.

1999 International Oceanic Conference

2.3.19 In follow up to NAT SPG Conclusion 33/7, preparations for the International Oceanic Conference, which will take place in Edinburgh from 24 to 29 October 1999, are well under way. In this connection, a venue has been chosen and the list of speakers is being finalised. NAT SPG members and observers were strongly encouraged to support this Conference and to confirm their attendance as early as possible.

2.4 Implementation planning

Extension of MNPS airspace in Santa Maria FIR

2.4.1 The Group was presented with a proposal to extend MNPS airspace to incorporate all of Santa Maria FIR South of 27° North. The Group endorsed this decision and agreed that Portugal initiate an amendment proposal to the NAT SUPPS (Doc 7030)

CONCLUSION 35/10 - EXTENSION OF THE MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS (MNPS) AIRSPACE IN THE SANTA MARIA FIR

That Portugal initiate an amendment proposal to the NAT Regional Supplementary Procedures (SUPPS) (Doc 7030) so as to extend MNPS airspace to all airspace within Santa Maria FIR South of 27° North.

Extension of RVSM to the entire NAT Region

2.4.2 The Group examined several proposals from Norway, Portugal and the United States to implement RVSM in the NAT Region outside of MNPS airspace. The Group agreed with the proposals and further agreed that the United States, in co-ordination with the ICAO EUR/NAT Office, develop the appropriate amendment proposal to the NAT Regional Supplementary Procedures (SUPPs - Doc 7030).

2.4.3 IFALPA agreed with the concept of expanding of RVSM in all areas of the NAT Region. However, IFALPA felt that implementation in the WATRS should not take place until such time as problems of convective activity, associated with high volumes of traffic and a complex route structure, were solved.

CONCLUSION 35/11 - EXPANSION OF REDUCED VERTICAL SEPARATION MINIMUM (RVSM) TO THE ENTIRE NORTH ATLANTIC REGION

That:

a) RVSM be implemented within the lateral dimensions of the NAT Region;

b) RVSM be implemented in the West Atlantic Route System (WATRS) area, taking into consideration the concerns expressed by IFALPA regarding the convective activity in the area; and

c) the United States, on behalf of the NAT SPG, initiate an amendment proposal to the NAT Regional Supplementary Procedures (Doc 7030).

Repatriation of RVSM aircraft with equipment problems

2.4.4 The Meeting was informed of some misunderstandings concerning the previously agreed procedures relating to the use of airspace reservations for the repatriation of aircraft with equipment problems or ferry flights through RVSM airspace. All NAT providers States agreed that, to-date, the spirit of NAT SPG Conclusion 28/28 had been applied. In this connection, the Meeting was informed that any information that would put in doubt this interpretation would be rectified; in particular, Canada agreed to withdraw its current NOTAM relating to this subject.

2.5 Other issues

Transition to the year 2000

2.5.1 The NAT Y2K Contingency Plan had been developed by the NAT IMG on the basis of the extensive work completed by the member States and the users in reviewing their operating systems and the subsequent assessment of low technical risk from Y2K. This has allowed the NAT Region to adopt a philosophy of "operations as usual". Therefore contingency routings and other aspects of a contingency plan were not considered appropriate for the NAT Region, especially considering the strategic nature of Air Traffic Control (ATC) Services being provided in the FIRs concerned. With this in mind, the Contingency Plan recognised that several dates were critical and that awareness was more important than contingency measures. Nevertheless, the Contingency Plan did require an increase in separation minima for the millennium date itself. This increase in separation minima would be terminated as soon as confidence had been established that the Air Navigation System was functioning normally.

2.5.2 In this connection, it was noted that the NAT Contingency Plan could not exist in isolation. A global strategy was being developed to ensure that all regional plans interleaved. With this in mind, it was evident that changes to the detailed part of the NAT Contingency Plan may be required because of global requirements. Considerations such as the use of Traffic Information Broadcast by Aircraft (TIBA) or other air-to-air measures needed to be evaluated. It was therefore agreed that the NAT SPG endorse the Contingency Plan[†], which had been developed by the NAT IMG, with the understanding that all changes made to it will be co-ordinated with all regular NAT SPG participants using e-mail and short response times.

[†] The NAT Region Y2K Contingency Plan was subsequently approved by the President of the Council, on 26 June 1999, including the caveats.

CONCLUSION 35/12 - ENDORSEMENT OF THE NORTH ATLANTIC (NAT) YEAR 2000 (Y2K) CONTINGENCY PLAN

That the NAT Systems Planning Group (NAT SPG) endorse the Y2K Contingency Plan developed by the NAT Implementation Management Group (NAT IMG) subject to the following:

a) account be taken of the latest developments stemming from the global Y2K planning activities;

b) all changes to the contingency plan be co-ordinated through the NAT IMG with all concerned prior to incorporating these changes into the document; and

c) the NAT Y2K Contingency Plan be published on the NAT Programme Co-ordination Office web site (www.nat-pco.org).

3. AGENDA ITEM 3 - AIR NAVIGATION SYSTEM REVIEW

3.1 Introduction

3.1.1 Under this Agenda Item, the Group considered the following specific subjects:

a) Review of system safety performance

b) Review of systems operations

3.2 Review of system safety performance

SCRUTINY MATTERS ‡

Lateral navigation performance accuracy achieved in the NAT Region during the period 1 January 1998 to 31 December 1998

3.2.1 The Group noted a significant decrease (25%) in the number of Gross Navigation Errors (GNE) in MNPS airspace compared with the previous 12-month period (1997). It also noted that the overall number of GNEs in the NAT Region as a whole had decreased by 15% compared with the last period. Recognising that there had been an 11 % increase in the level of traffic using MNPS airspace, the Group considered that, as a generic measure of safety, the number of GNEs in MNPS airspace did not give cause for concern.

3.2.2 In accordance with monitoring procedures, follow-up action was taken for any reported error in excess of 50 NM. The Group noted that this had to be done for 8 of 10 reported occurrences. With one exception, all of the errors were attributable to waypoint insertion or equipment control errors. The remaining one error was caused as a result of a compass system failure. It was also noted that two errors involved United States military aircraft.

3.2.3 Using flights per GNE as a measure of the lateral navigation performance, overall performance showed an improvement. While military operations followed last year's trend and continued to show an improvement, compared with public transport operations, the figure was still high enough to warrant concern. The performance of IGA aircraft was also an improvement on the previous year.

3.2.4 With respect to the application of the 10 minutes longitudinal separation, it was noted that the CMA had received 4 reports of erosions of longitudinal separation in excess of 3 minutes during the monitoring year compared to the same figure last year.

Methods of Improving the Observed Standard of Navigation Performance

3.2.5 In considering the methods by which the observed standard of navigation performance might be improved, account was taken of the lessons derived from the review of navigation performance. During the monitoring period, GNEs reported included a very high percentage of errors involving crew error. In particular adherence to the procedures set out in the MNPS Operations Manual (or similar company standard operating procedures) would have prevented the vast majority of GNEs from occurring. Furthermore, there was a firm indication that replacement of older types of aircraft with those having glass cockpits should continue to help reduce the number of GNEs.

‡ 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/35 and which is available on request from the ICAO EUR/NAT Office

3.2.6 In the course of the scrutiny of errors, the Group agreed that the following were significant contributory factors in either the risk of a GNE being committed or to increasing the overall system risk:

a) failure of crews to adhere to published procedures by not properly cross-checking clearances with information entered and stored in the navigation systems;

b) failure of crews to carry out post waypoint checks effectively; and

c) failure of crews to manually check the accuracy of waypoints resident in the Flight Management Systems (FMS) navigation database by manually converting the ARINC 454 shortened version position to a full position readout. When properly checked, 4850N would be displayed on the FMS as N48 00.0 W050 00.0 and not N48 50.0 W50 00.0, which caused one of the GNEs in 1998; and

d) apparent confusion among some crews involving reference to waypoints at 60N 10W, 61N 10W and routes UN601 and UN610 which are all in close proximity.

CONCLUSION 35/13 - CROSS CHECKING PROCEDURES WHEN OPERATING IN MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS (MNPS) AIRSPACE

That:

a) operators inform their crews of the need to adhere to published cross-checking procedures - as published in the Minimum Navigation Performance Specifications (MNPS) Operations Manual - when inserting waypoints and in particular, display the full readout of the waypoint name on the Flight Management Systems to avoid errors caused by corruption of the navigation data base; and

b) a change be made to the current wording of the remark on the daily track message to read "Eighty percent of gross navigation errors result from poor cockpit procedures. Always carry out proper waypoint checks".

Monitoring of Altitude Deviations in excess of 300 ft

3.2.7 The Group scrutinised the altitude deviations in excess of 300 ft received by the CMA in an attempt to establish any trends in the operation of aircraft in the NAT which led to operational errors in the vertical dimension. In this connection, it was noted that the major causes of the risk bearing deviations were:

a) failure on the part of ATC to co-ordinate clearances; and

b) failure of crews to climb or descend as cleared because of a mis-interpretation of a clearance.

3.2.8 A number of the risk bearing deviations categorised as crew error were a result of crews misunderstanding a clearance to climb or descend by a given longitude instead of a given latitude. Therefore, the Group agreed that there may be an inconsistency in the content of clearances being issued by different OACs; thus, it was further agreed that if a request to "report leaving" in addition to "report reaching" were to be included in the clearance, a reduction in the time spent at the incorrect flight level might be achieved. The Group agreed that the NAT IMG should examine this matter.

CONCLUSION 35/14 - PHRASEOLOGY

That the NAT Implementation Management Group be tasked with developing standard phraseology to be used throughout the NAT Region.

MATHEMATICAL MATTERS

1998 LATERAL AND VERTICAL COLLISION RISK ESTIMATES [§]

Lateral

3.2.9 It was recalled that NAT SPG/34 had agreed that the lateral risk for 1998 would be estimated in two parts: the risk during the period (January 1 to October 7) when RVSM Phase 1 was in operation, and the risk during the period of RVSM Phase 2 (October 8 to December 31) since this change had an effect on occupancies and therefore risk. It had also been decided that occupancies for both the 12 months before the start of RVSM Phase 2 and for the first 7 months of RVSM Phase 2 would be required to enable the lateral risk to be estimated. The Group examined the two sets of lateral occupancy estimates for the above periods and noted that, as a result of the implementation of RVSM, same direction occupancy had decreased and opposite direction occupancy had remained stable.

3.2.10 Prior to carrying out the lateral risk estimation, it was confirmed that it was still appropriate to use the existing error weights for the risk bearing errors that occurred in 1998. This was necessary since the weights used in the current lateral collision risk model depend to a slight extent on the relative same and opposite direction occupancies for the year being examined. Although it was not necessary to revise the weights this year, the Group agreed that a revision of the weights for all types of GNEs should be carried out for the next lateral risk assessment, since the occupancies for next year were expected to differ significantly from those at the time the weights were originally determined (NAT SPG/27).

3.2.11 The Group was informed that a particular type of GNE had been identified which had been caused by the loading of incorrect initial position into the aircraft navigation system (a gate initialisation error). The Group noted that such errors can result in an aircraft flying part or all of their track offset from their intended track. This type of error is analogous to the large height deviation event of December 1997 in which an aircraft crossed the Atlantic at the wrong level. The seriousness of this type of event was stressed because, under proposed future reductions of the TLS, a single GNE of this type could cause the TLS to be exceeded. On the basis of this information, the Group agreed that a unique weight was required for this type of GNEs.

CONCLUSION 35/15 - REVISION OF THE WEIGHTS FOR ALL TYPES OF GROSS NAVIGATION ERRORS (GNE)

That:

a) a revision of the weights for all types of GNEs be carried out; and

b) the results of the revision be presented to NAT SPG/36.

3.2.12 The Group determined the lateral risk estimate for 1998 during both RVSM Phase 1 and Phase 2 periods. The Group noted that the overall collision risk for all MNPS traffic had increased since last year's estimate but it was still slightly less than the four estimates before that. All the estimates were below the TLS of 20×10^{-9} fatal accidents per flight hour.

[§] For the 1998 lateral and vertical collision risk estimates together with a detailed discussion and analysis, reference should be made the report of the MWG presented to NAT SPG/35 and which is available on request from the ICAO EUR/NAT Office.

Vertical

3.2.13 As had been done for lateral occupancies, the Group determined the vertical occupancy estimates for the first seven months of RVSM Phase 2 operations. As was expected with the introduction of four more RVSM levels, the same direction occupancy values declined for both RVSM and non-RVSM levels. It was noted that the opposite direction occupancy had increased from Phase 1 to Phase 2, which was unexpected. It was therefore agreed that the cause of this increase would be further examined by the MWG and the results would be reported to NAT SPG/36.

CONCLUSION 35/16 - DETERMINATION OF THE CAUSE OF THE INCREASE IN THE VERTICAL OPPOSITE DIRECTION OCCUPANCY

That:

a) the NAT Mathematicians Working Group carry out a study to determine the cause of the increase in opposite direction vertical occupancy; and

b) the results be reported to the 36th meeting of the North Atlantic Systems Planning Group.

Risk Due to Operational Errors

3.2.14 The operational element of vertical collision risk, in both RVSM and non-RVSM environments, is determined from the estimate of time spent by aircraft at incorrect levels and the number of levels crossed without clearance during the monitoring year. Although the number of reports had been increasing since 1995 the trend was broken in 1998 with a slight drop in the number. This may indicate a greater awareness in the aviation community of the significance of these errors and the importance of reducing their frequency. It is also the result of more refinement in the estimation process.

3.2.15 All the 1998 combined risk estimates are within their respective TLSs of 2×10^{-8} fatal accidents per flight hour for non-RVSM levels and 5×10^{-9} for RVSM levels. There is a small increase in the predicted risk for Phase 2 RVSM operations due mainly to the increased number of allowed flight levels that would have been crossed. The situation for non-RVSM levels appeared to be affected more by changes in occupancy and the traffic volume at those levels.

3.2.16 Based on the review of large height deviations the Group identified a previously unseen source of risk bearing error. This concerned aircraft that had failed to achieve their correct level before entering Oceanic airspace. It was suggested that some pilots delay achieving their cleared level until shortly before Oceanic entry in order to conserve fuel and that this would possibly increase the chance of the pilot forgetting to achieve the correct level. The Group agreed that this was an important issue and that it should be dealt with when developing the video as outlined in paragraph 2.3.5 above.

Technical Risk

3.2.17 As was reported to NAT SPG/34, the technical risk (risk due to the height keeping ability of aircraft) has been found to be relatively small, compared to the risk due to large height deviations (risk due to operational errors).

3.2.18 Associated with technical risk, it was noted that, so long as non-compliant airframes continue to be identified quickly and then corrected, the risk associated with them would continue to be relatively small. It was emphasised however that there was an increase in risk associated with non-compliant airframes operating in the RVSM system and the importance of getting a non-compliant airframe re-monitored after an altimetry system fix should be stressed. Technical vertical collision risk in a non-RVSM

environment is deemed not to contribute to the measurable risk. This matter would continue to be monitored.

Altimetry System Error (ASE) Stability Studies

3.2.19 In accordance with the technical risk monitoring, an ASE stability analysis was being carried out using height-keeping data from the CMA database. A sample of 105 aircraft, which included repeat samples over two years worth of HMU measurements were examined statistically for signs of ASE drift. Although no clear cases of unstable ASE systems were identified, several aircraft appeared to exhibit a slight negative drift in mean ASE of the order of 30ft per year. This matter would be kept under review and, if necessary, brought to the attention of the NAT SPG.

3.2.20 After examination of the records from the CMA database for several aircraft, it was considered likely that the observed drift was in fact the result of using different measuring instruments sequentially (Prototype HMU, Strumble Production HMU, and Gander Production HMU). It is known that the production HMU at Strumble measured aircraft heights with a slight negative bias compared to the prototype. There may also be a different height measurement bias with the Gander HMU. It was agreed that a detailed analysis of the behaviour of the measuring instruments be made to eliminate such effects and provide explanations of the possible causes of such biases. The Group also agreed that any long-term changes in the reliability of met data should also be examined.

CONCLUSION 35/17 - ELIMINATION OF MEASUREMENT DIFFERENCES BETWEEN HEIGHT MONITORING UNITS

That the NAT Implementation Management Group undertake the task of determining and eliminating measurement differences between Height Monitoring Units.

Navigation Performance Studies

3.2.21 The effect of the carriage of GPS navigation equipment on the value of $P_y(0)$ (the probability of lateral overlap for aircraft on the same track) and the possible affect on the vertical and longitudinal collision risk had been discussed. With this in mind, the Group considered ways in which the core navigation performance of the NAT fleet could be more accurately characterised, since this was currently a matter of speculation based on limited evidence. To this end the Group agreed that initial efforts should be focused on confirming the results of the initial studies and on analysing more GPS flights.

3.2.22 The Group recalled that the need to carry out a new core navigation study had been addressed in NAT SPG Conclusion 34/12. The ability to do this study was subject to available resources and in fact it had not been possible to carry out this study to date. The Group agreed however that the requirement for a new study had now increased in urgency because of the uncertainty about the $P_y(0)$ value. Before such a study could be started it was agreed that a revised method for carrying out the study should be specified. Radar measurement methods used in previous studies were unlikely to be accurate enough to determine the performance of many current aircraft. It was therefore expected that a new core navigation study would have to be based largely on an analysis of aircraft sub-populations with different navigation equipment hierarchies. The method of determining lateral performance of such specified sub-populations would have to be investigated, as well as the sources and amount of data available. It would also be necessary to estimate the percentage of the NAT fleet which employ offsets and the frequency of application. The co-operation of operators would be necessary for the group to determine the navigational equipment fit of aircraft fleets**.**

CONCLUSION 35/18 - THE NEED TO CARRY OUT A CORE NAVIGATION STUDY FOR THE NAT REGION

That:

a) the NAT Implementation Management Group arrange to carry out a core navigation study; and

b) airspace users fully participate in this study.

3.2.23 Since projections of vertical and longitudinal collision risk will increase to unacceptable levels at some time in the future if navigation accuracy continues to improve at present rates, the Group agreed that discussions about employing systematic methods aimed at keeping $P_y(0)$ to adequate levels, such as issuing random offsets as part of an oceanic clearance, should be pursued, both from the risk and operational points of view.

CONCLUSION 35/19 - THE NEED TO STUDY THE EFFECTS OF INCREASED NAVIGATION ACCURACY

That:

a) the NAT Implementation Management Group (NAT IMG) study the effects of increased lateral navigation accuracy on vertical and longitudinal collision risk; and

b) the NAT IMG provide recommendations to the NAT Systems Planning Group on methods to mitigate the impact of increase lateral navigation accuracy.

3.3 Review of system operations

AIR TRAFFIC MANAGEMENT

North Atlantic Operations Managers' Meeting

3.3.1 The Group expressed its appreciation to the NAT OPS Managers for having presented their report in accordance with NAT SPG Conclusion 34/14. Having examined the report, the Group agreed that two issues needed NAT SPG consideration, namely the convening of annual NAT altitude reservation meetings and the altitude to be used when RVSM was suspended.

3.3.2 As regards annual altitude reservation meetings, the Group agreed that no such requirement existed considering that the necessary co-ordination could be taken care of within the NAT OPS Managers meeting itself. As regards the suspension of RVSM, the Group agreed that all flight levels, whether or not "RVSM levels", were useable and that it was not necessary to revert to ICAO Annex 2, Appendix 3 (conventional table of cruising levels).

CONCLUSION 35/20 - CONVENING OF ANNUAL NORTH ATLANTIC (NAT) ALTITUDE RESERVATION MEETINGS

That:

a) there was no requirement for annual NAT altitude reservation meetings; and

b) discussions concerning altitude reservations be carried out within the context of the NAT Operations Managers Meetings.

CONCLUSION 35/21 - REVERSION TO CONVENTIONAL VERTICAL SEPARATION

That, in the event of the requirement to revert to 2000 ft vertical separation minima for whatever reason, all flight levels specified in the reduced vertical separation minimum (RVSM) table of cruising levels specified in Appendix 3 to Annex 2 are useable, provided 2000 ft vertical separation was being applied.

COMMUNICATIONS

High Frequency Intercept Procedure

3.3.3 The Group recalled that NAT SPG Conclusion 33/16 stated that all NAT provider States co-ordinate amongst themselves in order to discontinue the HF intercept procedures. Canada, Iceland and Ireland were ready to implement this by 1 September 1999. Portugal and the United States could not indicate an implementation date because they had outstanding issues still to be resolved.

CONCLUSION 35/22 - DISCONTINUATION OF THE HIGH FREQUENCY (HF) INTERCEPT PROCEDURE

That:

a) Canada, Iceland and Ireland discontinue the intercept procedure in the NAT HF network by 1 September 1999; and

b) Portugal and the United States discontinue the intercept procedure in the NAT HF network once outstanding issues have been resolved.

HF & General Purpose Very High Frequency (GP/VHF) data collection and network loading in 1998

3.3.4 The Group examined data based on the results of HF and GP/VHF data collection exercises conducted in accordance with NAT SPG Conclusion 30/26. This data had shown that the network handled 3.691 million air-ground messages in 1998 - 78.6% HF and 21.4% GP VHF. Cumulative growth in the system for the four-year period 1994 to 1998 totalled 30.5%. The data indicated that at peak times congestion was evident on some of the network frequencies.

3.3.5 Traffic levels exceeding 800 messages in one hour were handled by the whole NAT HF system in 1996. In 1998 this rose to 950 messages. With annual increases in traffic, this could lead to the need for the system to handle peak hours of about 1200 messages by the year 2000. This issue would be kept under review and, if necessary, the NAT SPG will be informed of proposed corrective action.

3.3.6 Concern was expressed about unequal distribution of traffic over the various HF frequencies and families. It was clear that better management of the network would be necessary to alleviate congestion on some frequencies. The matter of appropriate allocation of frequencies would be raised again and the NAT SPG would be apprised accordingly.

RVSM - Impact on Communications

3.3.7 Information on the effects of RVSM on communications at New York air radio station had shown that, since March 1997, a marked increase in NAT HF traffic on a monthly and yearly basis. Allied to this, congestion resulting from ongoing increases in traffic movements and inappropriate use of the network were causing problems, particularly on Family-A. This matter would be addressed over the next year and the NAT SPG would be informed if required.

Frequency Spectrum Protection

3.3.8 The Group was reminded of the pressure that was being exerted in International Telecommunications Union (ITU) forums to reduce, or share with non-aviation users, frequency spectrum allocated for aviation use. Because, like ICAO, the ITU is a body of member States, the only effective way to ensure sufficient suitable radio spectrum for aviation was to have the necessary influence within each State telecommunication authority. Without this influence, despite all the efforts of ICAO, the long-term plans of aviation facilities and services were in serious jeopardy. CNS/ATM could be derailed by the lack of radio spectrum. ICAO State Letter had already advised States of the necessity for this action. The Group agreed that NAT SPG participants use their influence to ensure their State telecommunications authority took account of aviation requirements in developing the State position in preparation for the ITU World Radio Conference (WRC) 2000.

CONCLUSION 35/ 23 - AVIATION RADIO SPECTRUM PROTECTION

That, NAT Systems Planning Group participants take steps within their own States to ensure that aviation requirements for radio spectrum are taken into account in their telecommunications authority's preparations for the International Telecommunications Union World Radio Conference (WRC) 2000.

4. AGENDA ITEM 4 - DOCUMENTATION UPDATE

4.1 Introduction

4.1.1 Under this Agenda Item, the Group considered the following specific subjects:

a) NAT MNPS Operations (MNPS OPS) Manual

b) NAT Guidance Material

c) NAT Air Navigation Plan (ANP) and Facilities and Services Implementation Document (FASID)

d) NAT IGA Manual

4.2 MNPS OPS Manual

4.2.1 The Group was informed that the Eighth edition of the MNPS OPS Manual has now been published on the NAT PCO web site.

4.3 NAT Guidance Material

4.3.1 Considering that most States and international organizations had already commented on the draft Version 7 of the Guidance Material, it was agreed that the draft version, which takes into account all comments that have been received, editors suggestions and Secretariat comments, be published on the NAT PCO web site as soon as possible. All concerned would then be encouraged to comment on the draft version by 1 November 1999. After that date, the definitive Version 7 would be published and posted on the web site as a NAT SPG endorsed document. The expected final publication date was December 1999.

CONCLUSION 35/24 - PUBLICATION OF THE SEVENTH EDITION OF THE NORTH ATLANTIC (NAT) GUIDANCE MATERIAL

That, in order to publish a Seventh Edition of the NAT Guidance Material as soon as possible.

a) the ICAO European and North Atlantic (EUR/NAT) Office publish, on the NAT Programme Co-ordination Office web site, a draft version of the seventh edition of the NAT Guidance Material; and

b) States and international organisations concerned provide the ICAO EUR/NAT Office with their comments by 1 November 1999.

4.4 NAT Air Navigation Plan and Facilities and Services Implementation Document

4.4.1 The Group agreed that a review of the NAT ANP and FASID be carried out by the ICAO EUR/NAT Office and the NAT provider States concerned so as to be able to develop amendments to these documents in order to be able to publish definitive versions.

CONCLUSION 35/25 - PUBLICATION OF THE NORTH ATLANTIC AIR NAVIGATION PLAN PUBLICATION (NAT ANPP)

That, in order to ensure the early publication of the NAT ANPP:

a) the ICAO European and North Atlantic (EUR/NAT) Office, in co-ordination with the NAT Implementation Management Group, review the NAT Air Navigation Plan (ANP) with the view to developing amendments if required;

b) States review the NAT Facilities and Services Implementation Document (FASID) to ensure its accuracy and inform the ICAO EUR/NAT Office of any discrepancies by 15 October 1999; and

c) a consolidated amendment proposal to the NAT ANP and FASID be drafted by the ICAO EUR/NAT Office on behalf of the NAT provider States.

4.5 NAT IGA Manual

4.5.1 The Group was informed that the United States was in the final process of amending the NAT IGA Manual and that it would be published before the end of 1999. It would also be available on the NAT PCO web site.

5. AGENDA ITEM 5 - ANY OTHER BUSINESS

5.1 Introduction

5.1.1 Under this Agenda Item, the Group considered the following specific subjects:

a) NAT SPG working methods and next meeting

b) membership of the NAT Implementation Management Group

5.2 NAT SPG working methods and next meeting

5.2.1 The Group reviewed the experience gained over the last several years with the new planning process and agreed that further adjustments could be required to make the NAT SPG meetings more efficient. In this connection, it was agreed that NAT SPG meetings be limited to three days and that only papers requiring action by the NAT SPG should be presented. In other words, information such as risk assessments would be considered as extremely useful information but the groups responsible for using the material would be expected to only highlight issues that require NAT SPG decisions.

5.2.2 The Group reviewed its working methods with the view to improving them and of making the work of the NAT SPG Meetings as efficient as possible. In this connection, the Group agreed that NAT SPG/35 had proceeded smoothly and based on the experience gained, it appeared that the length of the meeting could now be reduced to 3 working days provided the following conditions were met:

a) all NAT SPG working groups must meet well in advance of the NAT SPG;

b) the reports of all NAT SPG working groups must be circulated to NAT SPG participants 30 days in advance;

c) only executive summaries, including draft Conclusions, would be presented to the NAT SPG and incorporated into the final report. The source reports and any other relevant supporting information would be part of the official meeting documentation; and

d) the final report would include lead in text to Conclusions and other information that the meeting considered important to highlight in the final report.

5.2.3 With the above in mind, and in order to reduce the duration of NAT SPG/36, it was agreed that the MWG and the ACSG meet at the ICAO EUR/NAT Office in Paris sufficiently in advance of the NAT SPG in order to ensure that their reports can be distributed 30 days in advance of NAT SPG/36. It was also agreed that the reports of the sub groups would not be presented to the NAT SPG in their entirety. Instead, an executive summary would be prepared which would include the highlights of the reports as well as any suggested action to be taken by the NAT SPG. The reports would still be considered as part of the official meeting documentation and could be opened if requested by a member or observer.

CONCLUSION 35/26 - WORKING METHODS FOR FUTURE NORTH ATLANTIC SYSTEMS PLANNING GROUP (NAT SPG) MEETINGS

That:

a) the Mathematicians Working Group and the Aeronautical Communications sub-group meet in advance of the NAT SPG at the ICAO European and North Atlantic Office;

b) the reports of all sub groups be distributed to the NAT SPG 30 days before the meeting; and

c) a working paper in the form of an executive summary, including suggested action, be presented to the NAT SPG with the understanding that the reports constitute part of the meeting documentation.

5.2.4 The Group agreed that its next meeting be held in the ICAO EUR/NAT Office from 6 to 8 June 2000.

5.3 Membership of the NAT Implementation Management Group

5.3.1 The Group considered the request from IBAC to become a member of the NAT IMG. This request was based on their perception of the importance of being involved in the management of the development of the NAT Air Navigation System. In this connection, IBAC stressed that it had recently undergone a reorganisation, which made it more capable of participating fully in air navigation planning activities and that it was committed to meet the same obligations as other NAT user organizations. Furthermore IBAC was prepared to make a commitment to ensure meaningful participation in NAT IMG activities and was prepared to ensure the representation of the business aviation community.

5.3.2 Taking into account the above, the NAT SPG reviewed IBAC's request and agreed that it would indeed be useful to have all of the user community represented within the NAT IMG. It was therefore agreed that IBAC should become a full member of the NAT IMG and that this decision would then be reviewed in three years time.

CONCLUSION 35/27 - INTERNATIONAL BUSINESS AVIATION COUNCIL (IBAC) MEMBERSHIP OF THE NAT IMPLEMENTATION MANAGEMENT GROUP

That:

a) IBAC become a full member of the NAT IMG; and

b) this decision be reviewed in three years.

LIST OF ACRONYMS

ACARS	Aircraft Communication Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
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
AMSG	Airspace Monitoring Sub-Group
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
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
EGNOS	European Geostationary Navigation Overlay Service
ELT	Emergency Locator Transmitter
EUR/NAT	European and North Atlantic
FAA	Federal Aviation Administration
FANS	Special Committee on Future Air Navigation Systems
FASID	Facilities and Services Implementation Document
FDE	Fault Detection and Exclusion
FDPS	Flight Data Processing System
FIR	Flight Information Region
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

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
IRS	Inertial Reference System
ITU	International Telecommunications Union
JAA	Joint Aviation Authorities
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
MSSR	Monopulse Secondary Surveillance Radar
MWG	Mathematicians Working Group
NAM	North American
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	NAT Implementation Management Group Cost Effectiveness
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
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
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
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
Y2K	Year 2000

– END –