

SUMMARY OF DISCUSSIONS OF THE NORTH ATLANTIC FUTURE AIR NAVIGATION SYSTEMS IMPLEMENTATION GROUP (NAT FIG)

SEVENTEENTH MEETING

(Ayr, 21 to –25 April 2008)

1. Introduction

1.1 The seventeenth meeting of the NAT Future Air Navigation Systems (FANS) Implementation Group (NAT FIG/17) was convened with the principal objectives of:

- a) reviewing the results of the data link operational trials and the report of the FANS Central Monitoring Agency (FCMA);
- b) agreeing on ways and means to incorporate global Required Communications Performance (RCP) related guidance material into NAT planning documentation;
- c) agreeing on how to accommodate FANS equipped International General Aviation (IGA) aircraft in the NAT trials;
- d) determining how Satellite Communication (SATCOM) voice could be used for routine Air Traffic Services (ATS);
- e) advancing work on the development of a North Atlantic (NAT) Region communications strategy;
- f) updating the NAT Interface Control Documents (NAT ICD); and
- g) examining how regional safety management processes can take advantage of information provided by data link applications.

1.2 The Meeting was chaired by Mr Norm Dimock, from Canada. Mr Jacques Vanier, from the ICAO European and North Atlantic (EUR/NAT) Office, was the Secretary. The Group was informed that the member for the International Federation of Air Line Pilots' Associations (IFALPA) was not able to attend. The Rapporteur welcomed the new representative from the International Business Aviation Council (IBAC) as well as participants from the IGA community. The lists of participants and contacts are at **Appendix A**.

1.3 The Group adopted the following agenda:

- a) Report on activities since NAT FIG/16
- b) Ongoing monitoring of various data link trials
- c) Report of the FCMA
- d) Report of the NAT SPG 2007 special meeting
- e) Examine ways and means to enhance the use of data link technologies;
- f) Issues related to HF regression;
- g) Data link initiatives for the North Atlantic Region;

- h) Data link Guidance Material
- i) Updates to the NAT Common Co-ordination Interface Control Documents
- j) Any other business

1.4 The papers and other documentation considered by the Group are listed in **Appendix B**. Additional specialised material was made available to the meeting as required.

2. Report on activities since NAT FIG/16

Review the NAT FIG/16 follow up action list

2.1 The Group reviewed the NAT FIG/16 follow up action list and agreed that all issues had been dealt with or had been documented and are reported on in this report.

Rate of aircraft equipage

2.2 The Group recalled that, at NAT FIG/16, Portugal had accepted the task of identifying costs of obtaining information related to the rate of aircraft equipage from aircraft database suppliers. It was also recalled that this task was in response from the lack of information received from the airspace user population.

2.3 In order to obtain that information, the member of Portugal contacted two aircraft database suppliers: JP Airlines Fleet and Jane's Aviation. The information received from JP Airlines fleet database cost GBP 750.00 for the information and extra costs of GBP 1000.00 or GBP 1500.00 if the information was updated quarterly or monthly. The information would be supplied in excel/delimited format by airline with aircraft type, registration, SELCAL and other information, and would include other important references to aircrafts in respect of orders and expected delivery timeframes. On the other hand, the information that could be provided by Jane's was more expensive for essentially the same data.

2.4 Considering that it had been shown to be almost impossible to obtain information from the users and that the information was required for planning, especially to determine future communications requirements, it was agreed to propose to the NAT IMG that Portugal should obtain the information from JP Airlines, which was the least expensive option. In addition, Portugal would have to determine how to recover the costs and if any limitations would exist on the use and distribution of the data within the NAT IMG planning machinery. It was agreed that this be brought to the attention of the NAT IMG.

Proposed Amendment to the NAT Regional Supplementary Procedures (SUPPS) (Doc 7030) regarding the use of HF families

2.5 The Group was presented with a proposal for amendment to the NAT SUPPS (Doc 7030) that would align the use of the NAT High Frequencies (HF) families to conform to the agreed High Frequency Management Guidance Material for the North Atlantic Region. It was noted that Portugal would now submit the proposal for amendment to the NAT SPG in June 2008 to seek their endorsement.

Review the outcome of NAT IMG/31 meeting

2.6 The Group was presented with an update on the outcome of NAT IMG/31, which had been held Paris from 12 to 14 November 2007. The Group noted that the action taken by the NAT IMG in follow up to NAT SPG/43 and in particular those Conclusions that had an effect on the NAT FIG work programme.

2.7 The Group was informed that the Canadian ATS system could be configured to provide the NICE task force with copies of ADS messages in the form of AFTN POS messages in real time. Doing so would be conditional upon an assurance that the receiving party would not disclose the identified data

outside the task force. It would also be conditional on approval by IATA and IBAC on behalf of their members. The member for the United Kingdom informed the Group that they were in the same position as Canada. The Secretary agreed to bring this to the attention of the NAT IMG and seek the approval of the user organisations to use the data.

Review the outcome of the Special NAT SPG2007 and RCP Task Force meetings

2.8 The Group was presented with an overview of the outcome of the Special NAT SPG 2007 Meeting ((15-16 November 2007) as well as the one of the Task Force (20-22 February 2008) set up by the NAT SPG to develop guidance material related to the performance of communications used to support data link applications. It also includes a proposed work programme for the implementation of the performance requirements. It was recalled that these meetings had been held pursuant to NAT SPG/43 Conclusion 43/xx

2.9 The Group was informed that one of the decisions of the Special NAT SPG Meeting was to finalise guidance material for RCP and associated monitoring. This was achieved through the establishment of a Technical Task Force that had met in Paris from 20 to 22 February 2008. It was noted that the Task Force had completed its assignment and had been disbanded. The Group noted that the major input into the work of the task force had been the draft material that had been developed by NAT FIG/16.

2.10 The Task Force had produced draft Performance Based Guidance Material for Communications and the draft Guidance Material for End-to-End Performance Monitoring of ATS Communications Services for North Atlantic Airspace. This material, which was based RTCA DO/306/EUROCAE ED 122, Safety and Performance Standard for Air Traffic Services in Oceanic and Remote Airspace (Oceanic SPR Standard), was being coordinated at a global level and was therefore not subject to change by the NAT Region planning machinery without consultation with the other stakeholders involved. The Group agreed that furthering this work was important in order to standardise at a global level FANS services. The Group supported presenting the material to the NAT SPG with the intention of adopting it as the basis for planning future data link applications for the NAT Region (paragraph 5.2 below also refers).

2.11 The Group noted that the Task Force had also initiated work to develop draft guidance material regarding notification of ATC and flight crews of data link based communications failure. Although it had not been possible to complete the task, a programme was identified for consideration by the NAT SPG. The Group was informed that it may be expected to take action on this issue subsequent to NAT SPG/44 planned for June 2008.

2.12 In addition to the above, the Task Force also developed an initial Implementation Plan for the Implementation of Data Link Required Communications Performance and Monitoring. The Group noted the draft plan but felt that until the NAT SPG had decided on a way forward, it would be pre-mature to expend significant resources to further refine the plan. The Group agreed that it propose to the NAT IMG that this be added to the Group's work programme.

Review the outcome of the 31st meetings of the NAT Air Traffic Management Group (NAT ATMG/31)

2.13 The Group considered the reports of NAT ATMG/31 which had been held in Limerick, Ireland from 10 to 14 March 2008. The Group noted the work that had been carried out by the NAT ATMG regarding the use of ADS-C event contracts to carry out conformance monitoring, especially in order to reduce risk due to Large Height Deviations (LHD) (paragraph 6.1 below also refers). The Group noted the discussion that had taken place regarding the reinstatement of some of the "EXPECT" CPDLC messages. It noted that Iceland would carry out an assessment of the viability to use the messages safely and report their findings to the NAT ATMG. The Group agreed to take no action until the analysis has been completed.

2.14 As regards the NAT ATMG discussions regarding the reduction in longitudinal separation minimum to 5 minutes using FANS 1/A, the Group supported the proposal that all aircraft with ADS-C

capability should provide periodic reports in addition to waypoint position reports. This would provide safety benefits and facilitate the implementation of reduced longitudinal separation.

2.15 In response to the request to provide the NAT ATMG with additional information concerning the possibility of specifying a CPDLC latency timer for each ANSP, the member for SITA informed the Group that it would first be necessary to agree on a technical method with interested parties such as the Communication Service Providers, ANSP's, Internetworking partners, Airbus, Boeing, and Operators. This would be necessary, at a minimum, to establish an agreed initial design baseline and to ensure that the solution would support any ground users who would not want such a timer as well as others who would want one particular timer value and still others who would want a different timer value, and so on. As well it would be necessary to determine for each user what particular uplink messages the timer should be applied to.

2.16 The solution would have to also address how the timer information gets passed from each user to an internetworking partner and how an internetworking partner knows what to do if an uplink is passed onto them relative to the timer. If the timer is applied on a per user level, an ability to look further inside the message to see who the ultimate uplink message originator was since the AEEC 620 level originator address would merely be that of the previous internetworking partner in the chain. All internetworking partners such as ARINC, SITA, AeroThai, ADCC China, DECEA Brazil, and Japan would likely need to coordinate to achieve functional uniformity in their respective implementations.

2.17 The AEEC-developed ground-ground and air-ground message exchange protocols have no provisions for the implementation of such a latency timer such as discussed at NAT FIG/16. The Group felt that, based on the information presented, it was not worth pursuing this issue and the NAT ATMG would be informed accordingly

Review the outcome of the seventh meeting of the NAT Safety Analysis and Reduced Separation Implementation Group (NAT SARSIG/7)

2.18 The Group noted the report of the seventh meeting of the NAT SARSIG, which had been held in New York from April 2008, and the related work done by the NAT SARSIG on the implementation of reduced longitudinal separation to 5 minutes, or T5. When that reduction could be implemented would depend on when the communications system could meet related performance requirements, in particular Latency (maximum message delay for specified continuity) and Availability.

2.19 Based on the NAT SARSIG/7 material on RLongSM, the Group agreed that assumptions made regarding the data link communications performance and the resulting requirements needed some clarifications by the NAT SARSIG. Specifically, there was a need to determine the required values for Latency, Continuity and Availability for the communications components.

2.20 The Group also recognized the work of the NAT SPG RCP Task Force in the development of RCP 240 and RCP 400 specifications in support of harmonization of data communication performance requirements. The Group agreed that the NAT SARSIG should be requested to consider these specifications in their feasibility modelling and safety assessments to determine whether these global specifications might be applicable to the reduced longitudinal separation minima planned for the NAT Region.

2.21 As regards to the Availability requirement, the Group noted that The FANS Satcom Improvement Team (FSIT) had identified the need for improvements to the satellite data link sub-network but these improvements must unfold one step at a time; therefore, the overall time frame was unpredictable. The Group noted that the planned date for the beginning of T5 trials was the last quarter of 2009.

2.22 The Group will monitor the work of the FSIT with special attention to timelines for improving Latency and Availability to the levels needed for T5. Furthermore, it was agreed that the

rappporteur would contact the rapporteur the NAT SARSIG to obtain the clarifications specified in paragraph 2.19 above and report to NAT IMG/32.

3. Ongoing monitoring of various data link trials

3.1 The Group was presented an analysis of data link services provided by Shanwick for flights within Shanwick Flight Information Region (FIR). The analysis demonstrated that the Oceanic Route Clearance Authorisation (ORCA) service was performing at the equivalent levels that preceded the implementation of SAATS. As regards ADS-C, some issues have been identified within SAATS, but these were associated with ground to ground aspects of the service e.g. forwarding of WPR to adjacent centres. NATS had implemented build fixes in SAATS to accommodate the problems and had ceased to use the CADS in a 'workaround' capacity from 2 April 2008.

3.2 The results for CPDLC mirror those mentioned above for ADS. However, the next reporting session was expected to show some differences based on the presumed inclusion of some IGA traffic utilising ADS-C only. It could be seen from the data presented that since the introduction of Phase IV CPDLC, there had been no real impact or increase in the message set usage for downlinks. However, there had been some impact or increase in the message set usage for uplinks. These were primarily messages used to confirm levels, time, speed and waypoints. This was expected behaviour in the NAT and it showed a benefit to ATC of moving to Phase IV CPDLC operations. There have been no recorded problems by ATC or Crews.

3.3 From the FMC analysis, it could be seen that the introduction of SAATS did not impact on the percentage of FMC flights in the NAT Region or the service provided by Shanwick. HFDL trials have ceased within Shanwick and Gander FIR's with agreement of Continental Airlines. The primary cause of this was the continued 'lateness' of HF voice reports resulting in overdue messages to ATC. The late HF voice reports were caused by the crews initiating HF voice reports some 7 minutes after the HF data POS report to allow for antenna switchover. With HF delay and Aeradio translation, many POS reports were arriving after the 10 min parameter.

3.4 The Group noted the information and further noted that Shanwick would provide an update of the performance statistics based on CPDLC % usage vs ADS % usage for the next reporting period.

4. Report from the NAT FCMA

4.1 The Group recalled that since taking on some of the tasks of the FCMA, Shanwick's most significant focus has been the coordination between FCMA and IGA users to move to official recognition that specified IGA aircraft can utilise the NAT ADS-C WPR system without any interoperability issues. Gulfstream G450 and G550 aircraft operated by NJIINC (Netjets)/Gulfstream Aerospace Corp. have been participating in a trial from 1 February 2008 to 30 March 2008 to ascertain the operational suitability of using specific aircraft.

4.2 A draft set of Success Criteria for ADS WPR trials was produced by the FCMA and issued to the NAT FIR's and the IGA companies. Since its release, one company has been actively participating in a trial to prove to FCMA that performance was adequate for operational use over the NAT. Details concerning the draft Success Criteria against which the current trial is running, the specifics of the current trial and the results to date as well as the Interoperability Trial format against which the current trial is running are contained in **Appendix C**.

4.3 The Group noted the test results and endorsed the inclusion of the draft success criteria into the NAT guidance material for future IGA trials. The Group also endorsed the work presented and agreed that the GULFSTREAM aircraft with Software build designated as Certification Delta met the interoperability requirements of the current NAT ADS-C WPR system and therefore the Interoperability Test Plan / Framework as presented for future trials.

4.4 With this in mind, the Group agreed to recommend to the NAT IMG that Gulfstream aircraft using the GULFSTREAM Software build designated as Certification Delta, or later approved version, on the Honeywell Primus Epic platform operated by NJIINC (Netjets)/Gulfstream Aerospace Corp. be accepted into the NAT FANS service. In agreeing to the foregoing, the Group also agreed on a control mechanism for further IGA operators using the same software / platform to enter FANS service (paragraph 9.1 refers).

4.5 The Group was informed that all Honeywell Primus Epic software was approved to DO-178B Level C standard. The GULFSTREAM Software build designated as Certification Delta includes DO-258A AFN and ADS functionality. DO-258A CPDLC functionality will be included in a later aircraft certification.

4.6 In concluding its discussions, it was agreed to ask for the United Kingdom to request the United Kingdom MET office to compare ARP reports from IGA aircraft from other aircraft at similar dates / times/ profiles for accuracy and report to NAT FIG/18.

5. Report of the NAT SPG 2007 special meeting

5.1 The Group recalled that the NAT Region and the Asia-Pacific Regions maintained separate documents within each region to standardize on procedures for FANS data link services. The Group also recalled that at NAT FIG/13, it had been reported that work had progressed to merge the ASIA/PAC and the NAT Guidance Material and produce an International ATS Data Link Operations Manual (IDLMO). The Special NAT SPG 2007 Meeting and the follow on RCP Task Force had developed material to add to the guidance material in support of RCP and associated monitoring. It was also agreed at that time that global documentation was needed to ensure harmonisation across all regions. With this in mind, the Group examined a proposal to meld the NAT and ASIA/PAC documents into one.

5.2 To accomplish this task, it would be necessary to establish a mechanism to develop the document and to nominate a point of contact to carry out the work. It was agreed that the rapporteur of the NAT FIG would be the point of contact for the NAT Region and that he would be responsible to coordinate the inputs with all of the other NAT FIG members from the ANSPs. With this in mind, the Group agreed to the establishment of a working group composed of members from ICAO headquarters and regional offices, the NAT FIG, the ISPACG Data Link Working Group, and the IPACG that would be tasked to prepare a global operational data link document that would:

- a) make changes to align the FOM with DO 306/ED 122;
- b) consider the Guidance Material for ATS Data Link Services in North Atlantic Airspace; and
- c) identify regional differences and make changes that would enable planning and implementation regional groups to adopt a global operational data link document.

5.3 It was further agreed that the task should be completed by the end of 2008.

5.4 The member for the United States would coordinate this matter with the groups from the ASIA/PAC Regions. Finally, the Group agreed to inform the NAT IMG of this proposal.

5.5 The Group recalled that it had developed draft RCP and end-to-end monitoring requirements at its last meeting and that the material had served as a base line for the Special NAT SPG 2007 Meeting. Subsequently, a Task Force was set up to further develop the draft documents in order to submit them to NATSPG/44 in June 2008 for endorsement. In developing the documents, the groups concerned were instructed to develop the material with global adoptability in mind. The Group was reminded that, although the documents were not subject to change prior to the NAT SPG, it was invited to comment on them.

5.6 With the above in mind, the Group agreed to recommend to the NAT SPG that the draft documents attached to the RCP Task Force Report be endorsed by the NAT SPG and that they be included in the NAT FANS Guidance Material bearing in mind the need for convergence with the ASIA/PAC Region (paragraph 5.2 above refers). The Group also agreed that the relevant parts of the amendments to version 5 of the ASIA/PAC FANS documentation be incorporated into the NAT FANS documentation and that the task be carried out as part of the documentation harmonisation task mentioned above.

5.7 The Group noted with appreciation the RCP monitoring work that had been carried out by New Zealand using ED122/DO306 as the basis and agreed that the material should be used to develop the NAT Region monitoring plan. In a more general manner, it was agreed that closer links with the ISPACG Data Link Working Group should be established to reduce to the minimum any duplication of effort and to prevent divergence between the monitoring programmes. This should also facilitate the exchange of data to help resolve issues. The Group agreed that this be brought to the attention of the NAT IMG.

5.8 The Group recalled that the new oceanic SPR (ED122/DO306) “safety and performance standard for air traffic data link services in oceanic and remote airspace (oceanic SPR standard)” provided requirements as regards the aircraft and ground systems design in order to meet the safety objectives for ATC data link over oceanic airspaces. The A350 FANS function were being designed in full compliance with ED122/DO306 requirements, with the assumption that the ground systems, with which it will interoperate, would also be compliant with the 24 requirements applicable to the ATS provider system. The Group agreed to assess if existing ground systems were compliant and provide an update to NAT FIG/18.

6. Examine ways and means to enhance the use of data link technologies

The use of ADS for conformance monitoring

6.1 The Group noted that the NAT IMG had endorsed its proposal to use Altitude Range Event Contracts to detect at an early stage LHD and to enable ATC to take corrective action. This could significantly reduce the current level of risk as it has the potential to reduce the number of LHDs as well as their duration, the main contributing factors to risk in the vertical plane. With this in mind, it was agreed that all ANSPs would develop a timeline to automate and implement the process in line with the concept agreed to at NAT FIG/16. The Group noted that the NAT ATMG was preparing operational procedures that would support the automation. Finally, it was agreed that all ANSPs would provide NAT FIG/18 with a progress report and their timeline for implementation.

6.2 The Group was also cognisant that conformance monitoring would have to be expanded to include the lateral plane as well. However, considering the urgency of reducing risk as soon as possible, efforts would initially be concentrated on the vertical dimension. The Group agreed to add conformance monitoring to the Table of NAT data link implementation dates which is at **Appendix D**.

7. Issues related to HF regression

7.1 The Group recalled that it had been tasked with updating the basic planning assumptions agreed to by NAT SPG/xx which were to be used to plan HF regression. Considering the developments regarding the unsatisfactory performance of the data link communications infrastructure, the implementation of the Open Skies Agreement and the continuous rise in HF traffic, the Group felt that HF regression was no longer a viable objective for the medium term but that it would be better to develop a communications strategy that included HF in some capacity. With this in mind, it was agreed to inform the NAT IMG that the planning assumptions should be considered as being refuted for the time being, and that a different approach to managing the future communications requirements would need to be developed. In the meantime, it would be prudent to maintain the current HF infrastructure as is.

7.2 The Group also considered the question of HF Minimum Equipment List (MEL) relief. It was agreed that any decision regarding MEL relief was contingent on the decision to use SATCOM voice for

routine ATC communications. This in itself was contingent on resolving the security issues and access time identified by the Satcom Voice Task Force (SVTF). It was therefore felt that this matter was best dealt with in the context of the NAT SPG decision to endorse SATCOM voice for routine ATC.

7.3 The Group noted with appreciation that Inmarsat planned to make a presentation to the ICAO Air Navigation Commission (ANC) in September 2008 at which time the issues raised by the SVTF would be brought to their attention so that the issues could be dealt with at a global level as was required.

8. Data Link Initiatives for the North Atlantic Region

Industry inputs

STRATEGIC LATERAL OFFSET PROCEDURES (SLOP)

8.1 The Group was presented with information on developments relating to the Strategic Lateral Offset Procedures (SLOP). It was recalled that by allowing pilots to randomly select to fly either on the route centre line or 1 or 2 nautical miles (nm) right of the centre line, SLOP would reduce the risk in the airspace. Furthermore, SLOP also accommodates wake turbulence avoidance procedures. However, the industry has not yet been successful in widely implementing SLOP as standard operating procedure. Part of the reason may be that SLOP requires additional, variable flight crew action for each flight leg.

8.2 Boeing described an automatic strategic offset function which may help mitigate hazards associated with altitude errors made by flight crews or air navigation service providers by injecting some inherent spacing laterally along the route, similar to the navigation uncertainty that existed prior to the adoption of satellite-based navigation, and does not require flight crew procedural action to activate. The automatic strategic offset function incorporates an automatic offset capability and would take into account the Required Navigation Performance (RNP) associated with the flight leg in determining when to start and terminate the offset function. The function would automatically provide an offset bias to the right of the programmed flight plan in increments of one tenth of a NM.

8.3 The Group welcomed the information and felt that, subject to some safeguards being implemented, it was a good concept that merited further consideration by the Groups directly concerned by the application of SLOP, namely the NAT SPG itself and the Safety Management Coordinating Group (SMCG). The Secretary agreed to bring this to the attention of the NAT IMG.

ADS-B IN-TRAIL PROCEDURES

8.4 The Group was presented with an overview of the live trials that have been carried out on 26th March 2008 within the Reykjavik area related to the use of ADS-B for the “In-Trail Procedure in Non-radar Oceanic Airspace” (ATSA-ITP) application. The Group agreed to monitor these developments to determine whether any potential existed to implement the procedure in the NAT Region.

FANS 1/A OVER IRIDIUM

8.5 The Group was provided with an update on developments relating to the use of Iridium as a viable sub-network for FANS 1/A operations. The Group noted that Iridium may offer an alternative form of satellite based communications to support data link applications. It was agreed to monitor these developments and the member for the United States agreed to provide updates as required.

9. Data link Guidance material

9.1 The Group discussed the advent of general aviation use of ADS-C in NAT airspace, and the problems that could arise if further guidance were not provided for them. It was agreed that the following

text be included in the Guidance Material, in order to capture the need for assurance that aircraft will be properly equipped and that crews will be properly trained:

“Authorization for use of data link

3.1.14 Operators are required to obtain a data link authorization with the State of registry in accordance with their rules and means of compliance (such as FAA AC 120-70a). This operational authorization should address flight crew training and qualification, maintenance, MEL, user modifiable software, service agreements with CSP, and procedures for submitting problem reports and data to the central reporting/monitoring agencies, FCMA for the NAT Region. It should also ensure that aircraft equipment has been approved for the intended use, e.g., RCP 240 or RCP 400 operations, in accordance with airworthiness requirements and related means of compliance (such as FAA AC 20-140).”

9.2 The Group agreed to clarify the meaning of FANS 1/A as follows: FANS 1/A – Future air navigation system 1/A as defined by DO258A/ED100A. The designation “FANS 1/A aircraft” refers to those that are fully compliant with the aforementioned documents. The designation “FANS 1/A ADS-C aircraft” refers to those that comply only with the AFN and ADS functionality defined by DO258A/ED100A. The Table below is an initial draft proposal that provides a summary of approved implementations that show the different types of aircraft operating in different environments.

Ref	Aircraft Label	Applicable operating environments		
		Type of Airspace	ATS Unit Label	Standards baseline
1	Link 2000+	Continental	Link 2000+	a) DO-290 Chg 1 and 2/ED-120 Chg 1 and 2, Continental SPR Standard b) DO-280B/ED-110B, ATN B1 INTEROP Standard <i>Note: “ATN B1” defined by relevant portions of standards only for context management (CM) application, and controller-pilot data link communications (CPDLC) application supporting the ATC communications management (ACM), ATC clearance (ACL), and ATC microphone check (AMC) data link services.</i>
2	FANS 1/A	Continental	Link 2000+ w/FANS 1/A	a) Same as for Link 2000+, plus b) DO-305/ED-154, FANS 1/A – ATN INTEROP Standard, for ATS Unit, except see Note 1 c) DO-258A/ED-100A, FANS 1/A INTEROP Standard, for aircraft only. <i>Note 1: FANS 1/A aircraft will require use of DM67 [free text] to mimic certain standardized message elements per DO-290/ED-120 Chg 1 and 2. See DO-305/ED-154, paragraph 4.2.13.2.</i> <i>Note 2: In accordance with Link 2000+ airspace definition, FANS 1/A aircraft will require use of a message latency timer per DO-258A/ED-100A, paragraph 4.6.6.9.</i>

3	FANS 1/A	Oceanic and remote	FANS 1/A	<p>a) DO-306/ED-122, Oceanic SPR Standard, Eligible for enhanced surveillance and RCP 240 and RCP 400 operations.</p> <p>b) DO-258A/ED-100A (or earlier version), FANS 1/A INTEROP Standard</p>
4	FANS 1/A	Oceanic and remote	CADS/FDPS	<p>a) DO-306/ED-122, Oceanic SPR Standard, Eligible only for enhanced surveillance portion of operation. (No RCP operations)</p> <p>b) DO-258A/ED-100A (or earlier version), FANS 1/A INTEROP Standard, (Applies only to aircraft).</p>
5	FMS WPR	Oceanic and remote	CFRS/FDPS	<p>a) DO-306/ED-122, Oceanic SPR Standard, Eligible only for enhanced surveillance portion of operation. (No RCP operations)</p> <p>b) ARINC 702A (Applies only to aircraft).</p>
6	FANS 1/A ADS-C	Oceanic and remote	FANS 1/A or CADS/FDPS	<p>a) DO-306/ED-122, Oceanic SPR Standard, Eligible only for enhanced surveillance portion of operation. (No RCP operations)</p> <p>b) DO-258A/ED-100A (or earlier version) only for ADS-C and AFN portions of standard. (Ed note: More detail may be required here.)</p>

Note 1: Aircraft not fully compliant with standards may require restrictions on use. Deviations should be identified with any restrictions in appropriate certification documents, e.g., Airplane Flight Manual (AFM) and addressed in Operational Authorizations.

Note 2: DO-264/ED-78A, sections 5 and 6, and other relevant portions of the document, provide guidelines in the form of compliance objectives for showing that the aircraft data communication system complies with the standards. Certification projects should provide traceability to these objectives to indicate acceptable verification that was completed.

Note 3: DO-264/ED-78A, section 4, and other relevant portions of the document, provide guidelines in the form of compliance objectives for developing standards supporting implementation of data communication systems. Certification projects based on standards not listed in Table 1 should provide traceability to these objectives to indicate acceptable verification that was completed. In the event new standards are applied, Aircraft Certification Offices (ACOs) should coordinate with the Aircraft Engineering Division (AIR-100) when determining validity of the standard.

Note 4. An aircraft data communication system may support all rows in the table; aircraft data communication systems that support Link 2000+ and FANS 1/A capabilities will require an interoperability standard.

Link 2000+ - [Eurocontrol term for aeronautical telecommunication network baseline 1 (ATN B1) ATC data link]

FANS 1/A – Future air navigation system 1/A. Initially a Boeing/Airbus term, now used generically to refer to FANS 1/A ATC data link that complies with DO258A/ED100A.

CADS – Centralized Automatic Dependent Surveillance [ARINC/SITA]

CFRS – Centralized FMC waypoint reporting system [ARINC/SITA]

FDPS – Flight data processing system

9.3 The Group was then presented with a proposal to update the Guidance Material to take account of the implementation of Phase IV¹ CPDLC as well as other changes to reflect all of the updates since NAT FIG/15. The Document would undergo the normal review process through the NAT ATMG before the Editor published the final edition as Version 17 on 31 May 2008.

9.4 In concluding its discussions on the Guidance Material, the Group noted that two new chapters that included the material endorsed by the NAT SPG RCP Task Force would be included as draft material pending full endorsement of the material by the NAT SPG (paragraph 5.6 above refers).

10. Updates to the NAT Common Co-ordination Interface Control Documents (NAT ICD)

10.1 In follow up to NAT FIG/16, the Group was presented with a proposal to amendments to the North Atlantic Common Coordination Interface Control Document, version 1.2.5. These amendments relate to the addition of the FANS Application Message (FAN) and FANS Completion Notification (FCN) message to the document. The Group endorsed the proposal with the caveat that they would be implemented on an “as required” basis. With this in mind, it was agreed that the members from Iceland and the United States would coordinate with the Secretary to develop the amendment which would then be circulated to all concerned for comments before publishing the agreed change.

11. Any other business

Future work programme

11.1 The Group agreed to recommend to the NAT IMG that work should be concentrated within the following:

- a) monitor operational data link services;
- b) develop a implementation plan for the use of RCP in the NAT Region;
- c) plan for the expansion of data link services;
- d) update the NAT ICDs as required;
- e) develop a draft communications strategy for the NAT Region;
- f) determine if CPDLC can be used to issue route clearances to destination without discontinuities;
- g) develop an implementation plan to use ADS contracts to enhance conformance monitoring capabilities; and
- h) provide inputs to regional safety management.

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Follow up action list

11.2 The Group updated its follow up action list, which is at **Appendix E**.

Next meeting

11.3 The Group agreed to recommend to the NAT IMG that NAT FIG/18 be held in Paris from 22 to 26 September 2008.

Report to NAT IMG/32

¹ CPDLC Phase IV: With the exception of certain agreed CPDLC messages, Phase IV is the full implementation of the defined CPDLC message set.

11.4 On the basis of the tasks dealt with by NAT FIG/17 and considering its proposed work programme, it was agreed that the following should be brought to the attention of NAT IMG/32:

- a) endorse the proposal that Portugal contracts with a commercial data supplier to obtain forecasts of fleet equipage (paragraph 2.4 refers);
 - b) endorse the proposed work programme to participate in the development of a global operational data link document (paragraph 5.2 refers);
 - c) endorse the proposed arrangements to ensure closer coordination with the ASIA/PAC Regions (paragraph 5.7 refers);
 - d) endorse the proposal regarding the HF regression planning assumptions (paragraph 7.2 refers);
 - e) endorse the proposed NAT FIG work programme (paragraph 11.1 refers); and
 - f) agree that NAT FIG/17 be held in (paragraph 11.3 refers).
-

APPENDIX A – LIST OF PARTICIPANTS*(Paragraph 1.2 refers)***CANADA**

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APPENDIX B – LIST OF DOCUMENTATION*(Paragraph 1.4 refers)*

<i>Working Paper</i>	<i>Agenda Item</i>	<i>Title</i>	<i>Presented by</i>
1		Draft Agenda	Secretariat
2	2 d)	Data link applications for International General Aviation (IGA)	Secretariat
3	1 d)	Outcome of the Special NAT SPG 2007 Meeting	Secretariat
4	9 b)	A Global Operational Data Link Document, agenda item 9.b)	United States
5	2	Monitoring FANS 1/A Performance against DO-306./ED-122, Oceanic Safety and Performance Standard	United States
6	10	Amendments to Add FAN and FCN Messages [to NAT Common Co-ordination ICD]	United States
7	8 c)	New Oceanic SPR compliance by ground systems	Airbus
8	7	SATCOM voice for ATC	Airbus
9	1 c)	Proposal for Amendment to the NAT <i>Regional Supplementary Procedures</i> (SUPPS) (Doc 7030) regarding the use of HF Families in the NAT Region	Secretariat
10	9 a)	Guidance Material for Aircraft Data Link Approvals	Canada
11	9 a)	Guidance Material for ATS Data Link Services in North Atlantic Airspace v 16 & Appendix A	United Kingdom
12	9 a)	Guidance Material re Crew Data Link Training	Canada
13	2 all	Shanwick Data link Performance	United Kingdom
14	3	FCMA Report - General Aviation ADS-C Trials	United Kingdom
15	4 a)	RCP for RLongSM	Canada
16	1 c)	Aircraft equipage database costs	Portugal

<i>Information Paper</i>	<i>Agenda Item</i>	<i>Title</i>	<i>Presented by</i>
1		Tentative Work Schedule	Secretariat
2	6 b)	FANS 1/A over Iridium Project	United States
3	8 c)	ADS-B In-Trail Procedure	Airbus
4	9 a)	Training and Authorization Guide for CPDLC and ADS-C	Canada
5	8 b)	RLongSM & Attachment	United Kingdom
6	8 c)	Automatic Strategic Offset Function	Boeing

REPORTS	
Report of NAT FIG/16	Secretary
Report of NAT ATMG/31	Secretary
Report of NAT IMG/31	Secretary
Report of NAT SARSIG/7	Secretary
NAT ICD Version 1.3	Secretary
NAT ICD Version 1.2.5	Secretary
Draft RCP Manual (Doc 9869)	Secretary
Special NAT SPG/2007 Report	Secretary
Report of the NAT SPG Task Force on RCP	Secretary

APPENDIX C – IGA ADS-C TRIAL DOCUMENTATION

(Paragraph 4.2 refers)

GA ADS-C WPR Pre Operational Trial Success Criteria

1. The table below defines the minimum values to be met and verified. This does not prevent the ATS service providers from negotiating more constraining contractual requirements with their communication service providers if it is thought necessary.
2. This trial success criteria applies to only those aircraft which are applying for registration with FCMA and are utilizing a ‘non-standard’ FANS-1/A avionics package.
3. The GA operator shall advise FCMA of aircraft registrations / callsigns, dates of intended flights for the purpose of measurement against the success criteria.

<p>In order to be accepted for Operational Trial, the system must be shown to provide ADS-C waypoint position reports that meet the following criteria on each and every flight of the Pre-operational Trial period.</p> <p>Due to the infrequent nature of GA traffic with this equipment at present, the standard successive 30 day period is waived and a suggested figure of 50 round trips should be used as a reasonable measure of success or failure against the success criteria.</p>	
1.	<p>94% of required HF voice Waypoint Position Reports (WPR) that are received from flights that participate, shall be accompanied by ADS WPRs that meet the following requirements:</p> <p>(Affected ATS units will evaluate trials results and will judge acceptability for operation in the OCA for which they are responsible. Consideration shall be given to what improvements can be expected in human and technical factors soon after the operational trial is implemented.)</p>
a)	Each ADS report shall be received by the ATC automation within 5 minutes of the aircraft’s arrival at the waypoint, as per the reported ATA.
b)	Each ADS report shall contain all data elements that are required for ATC, as per ICAO Doc 4444.
c)	Aircraft Ident (ACID) shall be correct as per filed flight plan.
d)	<p>Reported Position, ATA, Altitude, NEXT Position, ETA, and Ensuing Position data shall be accurate in the following respects, when compared with the corresponding data in any accompanying HF voice WPRs, after accounting for any apparent errors in the HF voice data.</p> <p><i>i) Small position discrepancies (up to 2 miles lateral), which can be caused by offsets, shall be discounted.</i></p> <p><i>iii) Altitude discrepancies due to climbs or descents in progress shall be discounted.</i></p> <p><i>iv) One-minute ATA discrepancies, which can be caused by FMC rounding versus truncating, shall be discounted.</i></p> <p><i>v) Two-minute, or smaller, ETA discrepancies, which can be caused by rounding/truncating differences, and by crew methods of adjusting FMC data when making voice reports, shall be discounted.</i></p>

2.	50% of ADS messages shall be received within three minutes of the aircraft's arrival at the waypoint, as per the reported ATA.
3.	98% of ADS ATAs shall agree with HF voice ATAs with an error of not more than 1 minute. 100% of ADS ATAs shall agree with HF voice ATAs with an error of not more than 2 minutes. However, apparent ATA errors in HF voice WPRs shall be discounted.
4.	ADS ETAs shall reliably predict ATAs, as accurately as do HF voice ETAs. Expressing the requirement in engineering terms: The Root-Mean-Square error ('error' being 'ETA minus subsequent ATA') of FMC ETAs shall not exceed that of HF voice ETAs. Investigated errors in HF voice WPRs shall be discounted.
5.	Fewer than 3% of ADS reports shall be duplicates.
6.	Extraneous ADS reports shall be sufficiently few so as to satisfy local requirements. Affected ATS units will evaluate trials results, and will judge acceptability in consideration of what improvements can be expected in human and technical factors soon after the operational trial is implemented. The subsequent operational trial will put controllers in the loop in real time, to recommend further improvements to geographical filtering.
7 ² .	Participating flights shall provide ADS derived ARP messages with accurate Wind and Temperature data, to MET facilities as appropriate for each FIR.

² Items 7 are not criteria per se; they are, nevertheless, requirements of the system.

GA Interoperability Test Results to Date

B1 Background

B1.1 Three companies contacted FCMA to register an interest in participating in the current GA ADS-C WPR testing.

- Gulfstream
- Bombardier
- NetJets

Of the 3 companies, Netjets have actively participated in the trial with regular NAT crossings. Gulfstream, the airframe manufacturer has presented a small number of flights for evaluation. Bombardier currently has no airframes available with the required FANS package installed to complete interoperability testing.

B1.2 The test results detailed in this paper are for specific Gulfstream aircraft operated by NJIINC (Netjets)/Gulfstream Aerospace Corp. over the period *01-Feb-08 to 30-Mar-08* and are for *the GULFSTREAM Software build designated as Certification Delta* aircraft only. 12 *trips* were notified by Netjets to NATS for analysis.

B2 Aircraft Certification

B2.1 All Gulfstream G450/550 Aircraft have the Honeywell Primus Epic Cockpit.

B2.2 The Gulfstream G450/G550 FANS-1 functionality is based upon the Boeing 747 FANS-1 functionality. The development is being done in two steps: The first is the AFN/ADS only functionality developed for Cert Charlie [C] and Cert Delta [D]. For this development, the Boeing 747 FANS-1 software was re-hosted to run on the Honeywell Primus Epic® platform. The second step is to add CPDLC in a later certification [Cert F]

B2.3 For the Boeing 747 FANS-1 development, a Boeing Air Traffic Services Systems Requirements and Objectives (SR&O) document was released describing the interoperability requirements for the system. Subsequently, RTCA DO-258A “Interoperability Requirements for ATS Applications Using ARINC 622 Data Communications (FANS 1/A INTEROP Standard)” was released (April 7, 2005). Honeywell has developed Compliance Matrices to DO-258A for the Gulfstream G450/G550 FANS-1 functionality. The Compliance Matrix for the Cert Delta AFN/ADS has been forwarded to FCMA for reference.

Requirements based testing was completed for the FMS and CMF products. In addition, integration testing on the Honeywell System Integration and Test Station (simulator) and flight testing was completed.

B2.3.1 *GULFSTREAM Software build designated as Certification Charlie*
The GULFSTREAM Software build designated as Certification Charlie contains some issues which were corrected in Certification Delta:

- Occasional Non-delivery of an FN_CON for up to 6 hours
- ADS disables due to NOCOMMs
- Strange ADS DIS downlink containing a partial FN_CON
- ADS reports too far before the waypoint (i.e. a non-procedural fix)
- FN_CON message indicates that the avionics has CPDLC

B2.3.2 *GULFSTREAM Software build designated as Certification Delta*

This is the version Gulfstream wish to have approved for the G450/G550 fleet operation.

Honeywell has resolved the issues with the Gulfstream aircraft with *Certification Charlie* affecting AFN/ADS operation for Certification Delta. These included:

- AFN logon incorrectly indicated ATC COMM (CPDLC) capability
- LOSS OF COMM resulted in immediate ADS disconnect (e.g. when switching between VHF and SATCOM)

- Datalink notification of waypoint sequence too early (waypoint sequence would not be accepted by CADS)
- Duplicate AFN logon sent when FMS master changed (observed as an additional logon six hours later)
- Automatic handoff (AFN Notification) between ATC centers not operational (affected operation outside of NAT)

During the Gulfstream Certification Delta software development, FCMA were able to verify ADS contract operation and AFN logon to CSCB and Gander (CZQX). Honeywell also conducted simulator and flight tests with Air Services New Zealand to test operation in the South Pacific. Flights have been successfully tested (from GS simulator) AFN logon and ADS operation for Shanwick with NATS.

B3 Results

B3.1 The results that follow in this paper document the progress of NetJets Gulfstream Certification Delta aircraft only.

The NJIINC (Netjets)/Gulfstream Aerospace Corp. aircraft participating in the trial are listed below together with their capabilities as regarding the FANS applications.

Type-Serial	Reg	Software Mod Level
G450-4010	N425QS	D
G450-4014	N415QS	D
G450-4025	N440QS	D
G450-4037	N445QS	D
G450-4054	N405QS	D
G450-4084	N470QS	D
G550-5042	N528QS	D
G550-5075	N518QS	D
G550-5156	N529QS	D
G450-4100	N448QS	D

Operated By Gulfstream Flt Ops [Not included in results]

G450	N450GD	D
G550	N550GD	D
G550	N550GA	D
G450	N450GA	D

B3.2 NetJets Results To Date.

Netjets reported 12 flights for analysis in the period.

The format of the trial consists of :-

- Crews report ADS WPR to operational SAATS
- Crews report WPF to Shanwick ATC via HF voice.
- Crews do not declare 'ADS' to Aeradio
- Shanwick analyse the ADS WPR vs the HF reports to the success criteria in Table 1 below.

B3.3 Gulfstream Certification Delta aircraft only.

# of SAATS POS reports received	28
# of HF reports received	21
# of Valid SAATS ADS Waypoints	27
# of Matched Reports - Valid ADS vs HF	18
# of Invalid ADS POS reports	1
# of ADS reports outside FIR's	0
% of Success [Matched Voice and Valid WP ADS reports]	100%

Of the limited number of Gulfstream Certification Delta reports received, all corresponding HF reports were matched to the ADS reports. ADS reports without matching voice reports are discounted.

Table 1 matches results of Gulfstream Certification Delta aircraft against the Success Criteria.

	Success Criteria	Gulfstream Certification Delta
1	94% of required HF voice Waypoint Position Reports (WPR) that are received from flights that participate, shall be accompanied by ADS WPRs that meet the following requirements:	
	(Affected ATS units will evaluate trials results and will judge acceptability for operation in the OCA for which they are responsible. Consideration shall be given to what improvements can be expected in human and technical factors soon after the operational trial is implemented.)	
a)	Each ADS report shall be received by the ATC automation within 5 minutes of the aircraft’s arrival at the waypoint, as per the reported ATA.	100.00%
b)	Each ADS report shall contain all data elements that are required for ATC, as per ICAO Doc 4444.	100.00%
c)	Aircraft Ident (ACID) shall be correct as per filed flight plan.	100.00%
d)	Reported Position, ATA, Altitude, NEXT Position, ETA, and Ensuing Position data shall be accurate in the following respects, when compared with the corresponding data in any accompanying HF voice WPRs, after accounting for any apparent errors in the HF voice data.	
	<i>i) Small position discrepancies (up to 2 miles lateral), which can be caused by offsets, shall be discounted.</i>	none
	<i>iii) Altitude discrepancies due to climbs or descents in progress shall be discounted.</i>	none
	<i>iv) One-minute ATA discrepancies, which can be caused by FMC rounding versus truncating, shall be discounted.</i>	none
	<i>v) Two-minute, or smaller, ETA discrepancies, which can be caused by rounding/truncating differences, and by crew methods of adjusting FMC data when making voice reports, shall be discounted.</i>	none
2	50% of ADS messages shall be received within three minutes of the aircraft’s arrival at the waypoint, as per the reported ATA.	100.00%
3	98% of ADS ATAs shall agree with HF voice ATAs with an error of not more than 1 minute.	100.00%
	100% of ADS ATAs shall agree with HF voice ATAs with an error of not more than 2 minutes.	100.00%
	However, apparent ATA errors in HF voice WPRs shall be discounted.	none
4	ADS ETAs shall reliably predict ATAs, as accurately as do HF voice ETAs.	Not evaluated
	Expressing the requirement in engineering terms:	
	The Root-Mean-Square error (‘error’ being ‘ETA minus subsequent ATA’) of FMC ETAs shall not exceed that of HF voice ETAs.	
	Investigated errors in HF voice WPRs shall be discounted.	
5	Fewer than 3% of ADS reports shall be duplicates.	0.00%
6	Extraneous ADS reports shall be sufficiently few so as to satisfy local requirements.	none
	Affected ATS units will evaluate trials results, and will judge acceptability in consideration of what improvements can be expected in human and technical factors soon after the operational trial is implemented.	

	The subsequent operational trial will put controllers in the loop in real time, to recommend further improvements to geographical filtering.	
7(1)	Participating flights shall provide ADS derived ARP messages with accurate Wind and Temperature data, to MET facilities as appropriate for each FIR.	Data only available from 17 th March 2008.

Table 1.

B4 Summary of Results

Table 2 details the POS reports that were used for analysis.

Date	Callsign	# of HF reports with POS info	HF Reports sent	# of matching ADS POS reports	ADS Reports Sent	% of matches
01-Feb-08	N518QS	2	30,20	2	30,20,15	100%
22-Feb-08	N405QS	1	15	1	15,20,30	100%
29-Feb-08	N415QS	2	30,20	2	30,20,	100%
03-Mar-08	N415QS	2	30,20	2	30,20	100%
05-Mar-08	N529QS	2	30,20	2	30,20	100%
06-Mar-08	N528QS	1	20	1	30,20,15	100%
07-Mar-08	N529QS	1	15	1	15,30	100%
12-Mar-08	N518QS	2	30,20	2	30,20	100%
13-Mar-08	N518QS	2	15,30	2	15,20,30	100%
26-Mar-08	N425QS	3	30,20,15	0		0%
28-Mar-08	N528QS	1	15	1	15,20,30	100%
30-Mar-08	N528QS	2	30,20	2	30,20,15	100%
		21		18		86%

Table 2

Table 3 details the Adjusted POS reports that were used for analysis.

Date	Callsign	# of HF reports with POS info	HF Reports sent	# of matching ADS POS reports	ADS Reports Sent	% of matches
01-Feb-08	N518QS	2	30,20	2	30,20,15	100%
22-Feb-08	N405QS	1	15	1	15,20,30	100%
29-Feb-08	N415QS	2	30,20	2	30,20,	100%
03-Mar-08	N415QS	2	30,20	2	30,20	100%
05-Mar-08	N529QS	2	30,20	2	30,20	100%
06-Mar-08	N528QS	1	20	1	30,20,15	100%
07-Mar-08	N529QS	1	15	1	15,30	100%
12-Mar-08	N518QS	2	30,20	2	30,20	100%
13-Mar-08	N518QS	2	15,30	2	15,20,30	100%
28-Mar-08	N528QS	1	15	1	15,20,30	100%
30-Mar-08	N528QS	2	30,20	2	30,20,15	100%
		18		18		100%

Table 3

1. Of the 12 flights used for analysis :-

- a. N425QS on 26th March has been discounted as it sent no AFN Logon to SAATS and hence no ADS WPR for matching. This is shown in the final results set in table 3.
- b. Of the 28 ADS WPR reports sent to Shanwick, 1 report had information that was not 100% complete. The report is shown below and is believed to be caused by the FMC processing other data at the time of ADS WPR generation. This has been seen on the NAT during previous trials.

WAYPOINT CHG [5458.9N/015-0.1W] [40996 FT] [213931] [7] [3]
 PREDICTED ROUTE [5300.9N/00934.1W] [13900 FT] [0025] [5254.3N/00855.7W] [8100 FT]

This 1 report out of the total makes a rate of 96.43% accuracy of all received ADS Reports.

- c. All ADS reports were received within 60seconds of sending.
- d. No discrepancies have been recorded in ATA or ETA between HF and ADS reports.
- e. Expected POS reports from trial aircraft are
 - i. 30W, 20W, 15W for EB aircraft
 - ii. 15W, 20W, 30W for WB aircraft

Of the adjusted results [Table 3] only 1 flight failed to make its midleg report [20W], several aircraft are seen to be not making their 15W [EB aircraft]. For Shanwick, the 15W is not actually required but useful for analysis purposes.

- f. Periodic reports for forwarding to the UK MET office have only been available from 17th March 2008 when Shanwick enabled the use of periodic ADS reports. Of the 12 aircraft, only 2 have had periodic contracts in place. The extracts below are from N528QS on the 13th April 2008. All Netjets aircraft with periodic reports have shown to be accurate and forwarded to Met office as per specification. The UK Met office will be requested to monitor the ARP reports from these aircraft and confirm accuracy of data against other aircraft on the same days/time.

Downlinked ADS Periodic Data	SAATS converted Data to UK MET
11:07:50 - BASIC REPORT [5501.5N/01728.9W] [42996 FT] [110705] [7] [3] 11:07:50 - METEO [34 GS] [-121.641T] [-54 C]	UANT99 KDDL 131107 ARP N528QS 5502N01729W 1107 F430 MS54 238/34 KT N528QS QXT AOW 131107 F07A
12:09:15 - BASIC REPORT [5502.4N/03106.8W] [42996 FT] [120857] [7] [3] 12:09:15 - METEO [23 GS] [095.625T] [-57 C]	UANT99 KDDL 131209 ARP N528QS 5502N03107W 1208 F430 MS57 096/23 KT N528QS QXT AOW 131209 F14A

GA Interoperability Framework

FANS CENTRAL MONITORING AGENCY

INTEROPERABILITY TEST PLAN – General Aviation FANS ADS-C WPR Services

OWNER: FCMA (UKNATS)

1. PURPOSE

1.1 This document is produced by UKNATS as part of the FANS Central Monitoring Agency [FCMA]. It's purpose is to propose a specific test plan for the introduction of General Aviation aircraft utilising FANS software packages over the North Atlantic [NAT] for the provision of ADS-C WPR.

2. SCOPE

- 2.1 The scope is limited to FANS ADS-C services over the NAT and GA aircraft of all types wishing to register with the FCMA for FANS services. NAT ATS providers have agreed this document and it is formally registered with the FCMA as a basis for testing the interoperability of FANS GA aircraft with the NAT ATS providers FANS service.
- 2.2 The scope of the FANS services offered for this Interoperability test plan are limited to Automatic Dependance Surveillance – Contract [ADS-C] only at this time.
- 2.3 CPDLC service is offered through the NAT but will be subject to separate acceptance trials from operators. The scope of CPDLC is outwith this document.

3. Interoperability Testing

- 3.1 Interoperability testing shall take the form of several distinct steps:
- Registration with FCMA
 - Declaration of conformance to DO-258A : 'Interoperability Requirements for ATS applications using A622 Data Communications' for the FANS functions.
 - Formal connectivity test and acceptance with one or more of the NAT ATS providers Test and Development Systems.
 - Pre-Operational trial
 - Conformance to the NAT agreed success criteria.
 - Formal Acceptance to NAT FANS service from FCMA and entry to ATS DataBase.

4. Registration with FCMA

- 4.1 All GA operators shall comply with the current guidance material to supply the required information and intent to the FCMA.
- 4.2 The current guidance material can be found at :-

<http://www.nat-pco.org/nat/Current%20Datalink%20GM.pdf>

5. Declaration of Conformance to DO-258A

- 5.1 All GA participants shall obtain from their aircraft manufacturer a compliance matrix to the requirements as laid out in DO-258A: ‘Interoperability Requirements for ATS applications using A622 Data Communications’ that specifically relate to the FANS based functions.
- 5.2 This shall be submitted to FCMA before any formal Pre-operational trials can start.

6. Formal Connectivity Test

- 6.1 At least one formal connectivity test shall be performed with at least one of the NAT ATS providers Test and Development systems.
- 6.2 This will ensure that connectivity is correct through the DSP’s and that the GA aircraft can logon to the ground system for FANS services. As a minimum, the message set used for this test will consist of:
- AFN_Logon,
 - WP Event Contract / acceptance,
 - Periodic Contract / acceptance,
 - Emergency Contract / Acceptance and
 - Correct cancellation of contracts.
 - Handovers to adjacent centres may be tested if resources are available and coordinated correctly.
- 6.3 The results of the connectivity test shall be reviewed and distributed to the NAT ATS service providers by the FCMA. Based on the results of the test(s), a recommendation to either:
- 1) Progress to a pre-operational trial or
 - 2) Conduct further testing, will be given.
- 6.4 Once NAT ATSP agreement has confirmed, the FCMA will coordinate the agreed recommendation to the relevant GA bodies.

7. Pre-Operational trial

- 7.1 The FCMA will coordinate and formally publish a start date for the trial through liaison with the respective participating ATSP’s.
- 7.2 The FANS Pre-Operational Trial shall require NAT flights logging onto a ground system and making routine Way Point Reports via ADS-C whilst continuing the provision of HF Voice Way Point Reports as well. The ground system logon details are as provided in the GM and will be confirmed to the operator prior to the start of the trial.
- 7.3 Prior to commencing an ADS-C flight, operators shall ensure the following data is provided to the FCMA (for onward distribution to participating ATSP’s):
- Flight callsign/registration
 - Date of flight(s)
- 7.4 The provision of this information will allow each ATSP to put in place the necessary procedures to handle these flights e.g. if the flight is connecting to an operational ground system.

- 7.5 Until formal acceptance is granted by FCMA, HF Voice reporting for Way Point Reports MUST continue to be provided. ADS-C POS reports will be monitored against the HF voice reports for measure against the published success criteria.
- 7.6 The FCMA require a minimum of 50 round trips per aircraft/avionics type to establish a good data set for measurement against the success criteria.

OR

- 7.7 The FCMA will coordinate and formally publish a start date for the trial through liaison with the respective participating ATSP's.
- 7.8 The FANS Pre-Operational Trial shall require NAT flights logging onto the ARINC TADS centralised ADS service. The DSP's shall forward the TADS log files to the relevant ATS operators for analysis. HF Voice POS reports shall be mandatory for these flights..
- 7.9 Until formal acceptance is granted by FCMA, HF Voice reporting for Way Point Reports MUST continue to be provided. TADS ADS-C POS reports will be monitored against the HF voice reports for measure against the published success criteria.
- 7.10 The FCMA require a minimum of 50 round trips per aircraft/avionics type to establish a good data set for measurement against the success criteria.

NOTE : ARINC TADS is available for use only while NATS have a contract with ARINC for CADS. Bullets 7.7 – 7.10 should be used as the current guidance for test and evaluation UFN.

8. Formal Acceptance

- 8.1 Once the previous steps are completed fully, and only then, will formal FCMA approval be given to the trial aircraft operator or manufacturer as appropriate.
- 8.2 Once approval is granted, the FCMA will publish the information to all ATSP's in the NAT for inclusion of relevant tail numbers in the respective ATS databases.

**APPENDIX D – TABLE OF NAT DATA LINK IMPLEMENTATION DATES
AS OF APRIL 2008**

(Paragraph 6.2 refers)

Implementation	Operational cut-over
ADS	
◆ Waypoint & Met. Reporting	
– Gander & Shanwick	Jan 2001
– Reykjavik	Aug 2001
– Santa Maria	Oct 2001
– New York	Sep 2003
– Bodø	Mar 2004
◆ Local ADS	
– New York	Jun 2005
– Gander	Feb 2005
– Santa Maria	Dec 2006
– Shanwick	Nov 2006
CPDLC	
◆ NAT Phases 1 & 2	
– Gander & Shanwick	Nov 2002
– Reykjavik	Apr 2005
◆ Full implementation	
– New York	Mar 2003
◆ NAT Phase 3	
– Gander & Shanwick	Dec 2003
– Santa Maria	Dec 2006
◆ NAT Phase IV	
– Gander	Jan 17 2008 ³
– Shanwick	Jan 17 2008
– Reykjavik	Jan 17 2008
– Santa Maria	Jan 17 2008
◆ Special cases	
– Shannon (uplink SSR Code & frequency)	1 Q 2011
FMC WPR	
– Bodø	2Q 2005
– Gander	Nov 25 2004
– New York	
– Reykjavik	2Q 2006
– Santa Maria	Nov 25 2004
– Shanwick	Nov 25 2004
◆ Local FMC	
– Santa Maria	Apr 2007
OCL	
◆ Voiceless operation	
– Shanwick	Nov 1996
– Gander	May 2006
– Santa Maria	Sept 2007
– Reykjavik	2Q 2009
–	

³ Route clearances may not be operationally applied except in New York OAC

Automation of Altitude Range Event Contract

- Bodø
- Gander TBD
- New York TBD
- Reykjavik TBD
- Santa Maria TBD
- Shanwick TBD
-

Automation of Lateral Deviation Event Contract

- Bodø TBD
 - Gander TBD
 - New York TBD
 - Reykjavik TBD
 - Santa Maria TBD
 - Shanwick TBD
-

APPENDIX E – FOLLOW UP ACTION LIST*(Paragraph 11.2 refers)*

ID #	TASK ID	WHO	WHEN	X-REF
17-1	Present a PfA to the NAT SUPPs regarding the use of NAT HF families to NAT SPG/44	Portugal	NAT SPG/44	para. 2.5
17-2	Obtain agreement from the users to provide the NICE programme with POS data to support NICE	Secretary	NAT IMG/32	para.2.7
17-3	Seek clarifications from the rapporteur of the NAT SARSIG regarding the numbers used in the collision risk modelling to support T5	Rapporteur	NAT IMG/32	para. 2.22
17-4	Provide CPDLC % usage vs ADS % usage for the next reporting period	United Kingdom	NAT FIG/18	para. 3.4
17-5	Request the United Kingdom MET office to obtain comparison data of ARP reports from IGA aircraft with other aircraft	United Kingdom	NAT FIG/18	para. 4.6
17-6	Determine ground systems compliance with ED122/DO306	All NAT ANSPs	NAT FIG/18	para. 5.8
17-7	Develop timelines for the automation and implementation of Altitude Range Event Contracts	All ANSPs	NAT FIG/18	para. 6.1
17-8	Develop an amendment to the Common Coordination Interface Control Document (ICD) Version 1.2.5 to incorporate FAN and FCN messages	Iceland, United States & Secretary	ASAP	para. 10.1
17-9	Review the guidance material and provide comments to the editor	All concerned	10 May 2008	para.
17-10				
17-11				
17-12				
17-13				

- END -