IBAC Technical Report Summary

Subject: NAT Operations and Air Traffic Management

Meeting: *North Atlantic (NAT) Technology and Interoperability Group 1st (TIG/1)*

IBAC File:

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Summary: The First Meeting of the ICAO NAT Technology and Interoperability Group (NAT TIG/1) was held from 4 to 8 April 2016 in Paris, France.

NAT TIG was established by NAT IMG Decision 47/01. In response, ICAO EUR/NAT invited states to nominate members and rapporteur candidates. Iceland nominated Mr. Bjarni Stefansson for NAT TIG Rapporteur. The group agreed and elected Mr. Stefansson as Rapporteur.

The group thanked the former Rapporteur of the NAT Communications, Navigation and Surveillance Group (CNSG) Mr. Noel Dwyer (Canada) for his exemplary chairmanship that he demonstrated during his tenure.

The meeting agenda included review of latest developments, data link and voice performance monitoring and analyses, reports by states, industry and Data Link Monitoring Agency (DLMA), and planning/implementation.

The group reviewed the initial work programme and follow up action list as approved by NAT IMG/47.

Regarding the action to "Coordinate with the ICAO Operational Data Link Working Group (OPDLWG) the CNSG/13 considerations on Reduced Lateral Separation (RLatSM) Special Emphasis Items", the group was informed that coordination was taking place and an appropriate amendment to the ICAO Global Operational Data Link (GOLD) Manual was anticipated by the end of 2016.

Concerning the action to "Review information provided in CNSG/13 IP/28 and investigate ways to optimise data link performance, including the provision of very high frequency (VHF) data link coverage data/maps", the group noted that the communications service providers (CSPs) were providing raw data to avionics manufacturers who then produced tailored per aircraft operator coverage maps. However, not all avionics have sufficient resolution to perfectly match the real VHF data link coverage.

The group noted that there were data link performance degradation issues observed in the media transition areas reported numerous times to the NAT CNSG and NAT DLMA. It was believed that by optimizing the VHF area definition parameters of aircraft systems the data link performance could be improved.

Optimisation of the VHF coverage area definition would need to be fully investigated. Then it would be possible to determine whether the use of satellite communications (SATCOM) based Future Air Navigation Systems (FANS) 1/A shall be mandated in the areas of the NAT data link mandate (DLM) applicability.

In regard to the action "NAT air traffic services (ATS) providers to confirm that they comply with the ICAO Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM) (Doc 4444) Section 14.3.8 requirement, it was noted that all NAT ANSPs comply; however, there were some slight variations in procedures. Possible regional standardization and a GOLD update will be coordinated with the OPDLWG.

The group noted the NAT IMG guiding principles for project teams (PT) and NAT IMG decision establishing the Aircraft Message Latency Monitor Evaluation Project Team (AMLME PT) for which NAT TIG is the supervisory body. The AMLME PT will report progress at the next meeting.

The group noted the controller pilot data link communications (CPDLC) and automatic dependent surveillance (ADS-C) performance reports by the NAT ANSPs. All reports agreed that aggregated 95% criterion of the ADS-C Required Surveillance Performance (RSP) 180 and CPDLC Required Communication Performance (RCP) 240 requirement was met. Some reports included a pilot operational response time (PORT) filter value of 12 seconds which provided better PORT estimation and slightly improved overall results.

Iceland presented a new and promising method of visualisation of data link performance measurements using area maps. Iceland will provide a comparison of the results with the VHF coverage data and maps provided by CSPs and avionics manufacturers.

The annual NAT data link performance report for 2015 will be based on the inputs provided by the ANSPs and will include data link equipage statistics. The data included CPDLC, ADS-C, required navigation performance (RNP) 4 and automatic dependent survelliance-broadcast (ADS-B) capability as filed in the flight plan and the actual usage divided by organised track (OTS) and non-OTS traffic and per operator. The data presented suggested steady increase in CPDLC/ADS-C, RNP 4 and ADS-B equipage/usage in 2015.

The statistics also identified operators with inconsistencies between flight plan filed equipage and actual equipage or usage of equipment. The Group agreed that this information should be provided to the NAT IMG and NAT SOG for possible follow up with the airspace users and State safety oversight authorities.

NAT TIG noted the DLMA and Airbus actions on the Problem Report (PR) investigations and resolutions since CNSG/13. Of 227 PRs, 77 (34%) occurred in the NAT.

DLMA provided a Table listing PRs for which avionics fixes were (or will soon be) available but were not necessarily installed on all aircraft. The Group agreed that this Table should be brought to the NAT IMG to encourage the NAT airspace users to complete aircraft upgrades as soon as possible to improve data link performance. Availability of these fixes could be considered as one of the conditions for PBCS approvals.

Gander and Shanwick notified the group that for planning purposes necessitated by the NAT Data Link Mandate (DLM) and RLatSM, they rely on correct use of ICAO flight plan indicators and therefore no longer initiated data link connection with those flights that did not indicate data link capability in the flight plan.

The Group was provided with reports on CPDLC message elements usage identifying free text messages that would defy the realization of ground and aircraft automation.

The Group was provided with the assessment of the frequency and location of events when a Message Assurance (MAS) response is received more than 300 seconds after the message was sent by the ATSU in the Shanwick OCA, with specific emphasis on airframes with repetitive non-delivery of messages. The Group noted that this information was essential to continue the work to resolve uplink message non-delivery issues.

The AMLME project team will evaluate whether a latency timer could be implemented at the network level. In the meantime, the ANSPs and aircraft operators should submit problem reports to the DLMA for each occurrence of uplink message non-delivery or with a delay more than 300 seconds, including details to identify root causes.

Shanwick provided a report on the number of messages of 'Aircraft Not Logged On' (0.89% of total CPDLC uplink messages) or 'Unknown Aircraft Number' (0.16% of uplink messages) received by Shanwick OCA for Jul - Dec 2015. The majority of 'Aircraft Not Logged On' messages were received in the area around the Gander/Shanwick boundary. The majority of 'Unknown Aircraft Number' messages were received either at the Gander/Shanwick boundary or at the Shanwick/Shannon boundary.

Inmarsat provided an update on the system current status and plans, system coverage and performance. A contract has been awarded for the delivery of two I-6 satellites. The first satellite, Inmarsat-6 F1 (I-6 F1), will be delivered by 2020. The sixth-generation fleet will feature a dual-payload with each supporting both L-band and Ka-band services. The new satellites represent a step change in the capabilities/capacity of L-band services.

Inmarsat reported that it has relocated its I-3 F5 satellite to AOR(W) where it has replaced the I-3 F4 satellite, which has reached the end of its operational life. I-3 F5 is the youngest satellite in the I-3 fleet and will extend the life of the AOR(W) service. The I-3 F5 transition was successfully undertaken on Monday 21 March 2016.

With regards to the coverage over Greenland, Iceland provided a comparison of the ADS-C reports received over I-4 versus those received over I-3. The coverage areas with I-3 was expanding up to 82 degrees North. Based on this the AIP of Iceland was stating that FANS 1/A services were provided up to 82 degrees North. With I-4, it appeared that the coverage was limited up to about 74 degrees North. The Group reiterated previous statements that the coverage provided by I-3 over Greenland should be the target for improved coverage.

The Group noted an update on the FANS 1/A over Inmarsat Swift Broadband Services (SBB) evaluation project.

Iridium provided updates on the constellation status, Iridium NEXT launch and service evolution, and on the status of the CERTUS Service. In particular, the Group noted some changes in the original Iridium launch plan and information on the Push-to-Talk functionality that will be offered by Iridium NEXT. Iridium was invited to provide more information on this functionality and further updates at the next meeting.

The 2015 NAT voice communications traffic consolidated report identified that the total amount of messages using high frequency (HF), general purpose (GP) VHF and satellite voice communications (SATVOICE) media contacts for the aeronautical radio communications stations during 2015 was 3,167,381. Their distribution was: 72.3% HF, 27.5% VHF and 0.2 % SATVOICE. Portugal reported the unsuccessful rate of ground to air initiated calls 2.07% on HF and 16.8% on SATVOICE. The number of flights not establishing voice communications with the radio communications stations remained to be of concern. From 1 Jul - 31 Dec 2015 there were 5858 cases in Canada, 250 in Ireland and 127 in Portugal.

NAT TIG discussed the use of CPDLC UM137/DM40 (Confirm Assigned Route/Assigned Route) for route conformance monitoring related to the RLatSM trial by the United Kingdom and Canada. A manual transmission of UM137 and an automated conformance check of DM40 was used by NATS. Gander used UM137 to confirm that the FMS oceanic route matched the ground system.

The Group noted that there were clear safety benefits to be gained by automating the use of the UM137/DM40 and associated conformance checking. However, the target success rate of 90% for receiving DM40, without CPDLC free text or HF Voice, has not yet been attained. (Current rate is 78%.)

The Group agreed that it was necessary to enhance awareness on the use of UM137/DM40 among the flight crews. IATA and IBAC will continue to inform their members. The Group agreed that a common aeronautical information circular (AIC) by the NAT ANSPs would be useful and that a NAT Ops Bulletin might be needed. The Group was also informed that there were some IGA aircraft which may not support the DM40, IBAC agreed to investigate and report back to the ANSPs and TIG/2.

The Group was informed about the activities and progress the PBCS Project Team was making towards developing an impact assessment, a transition strategy, and an amendment to the NAT Regional Supplementary Procedures (Doc 7030). A secure website database was proposed for sharing operator/aircraft performance data to aid states in PBCS approvals prior to the November 2016 applicability of PBCS provisions.

The Group reviewed the latest versions of the draft NAT CPDLC route clearance implementation plan, the Concept of operations and implementation status. The implementation of CPDLC route clearance uplinks is progressing in the NAT. IATA will coordinate updates to the documents for endorsement at NAT IMG/49.

Canada presented an incident summary where a CPDLC level report was sent to the ground prior to the aircraft leaving its original flight level. It was noted that the display page that allows the crew to ARM the report to be sent automatically when reaching the cleared flight level also allows sending the level report immediately. The Group agreed that additional education and awareness material for flight crews/controllers was required to mitigate the risks. IATA and IBAC agreed to disseminate this information to their members to raise awareness.

Iceland and Canada noted a high failure rate for data link transfers which needs further investigation.

Iceland presented information on ADS-B Call Sign and CODE errors observed during Jan – Dec 2015. The total for incorrect CODE was 0.27% and 0.42% for incorrect Call Sign. With a recent NAT Doc 7030 amendment it is now mandatory to include the CODE in the FPL if available. IBAC informed that a bulletin was issued for their members to raise awareness on this requirement. Further monitoring will be needed to identify trends.

Mr. Alastair Muir (the United Kingdom), the NAT IMG Chairman, addressed the group, informing them about the purpose of the latest NAT IMG reorganisation and the expectations that the NAT IMG had from the TIG.

In this context, the group discussed the best way to handle tasks previously performed under ACSG. The group agreed to subsume technical issues under NAT TIG and operational issues under NAT POG. The annual voice communication system performance report and voice traffic volume statistics will be presented to NAT TIG.

The second meeting of the NAT TIG will take place from 17-21 Oct 2016 in Dublin, Ireland. The third meeting is scheduled on 3-7 Apr 2017 in Paris, France.

Implication for Business Aviation:

Note. The United Kingdom and Canada are using CPDLC UM137/DM40 (Confirm Assigned Route/Assigned Route) for route conformance monitoring related to the reduced separation RLatSM trial in the NAT.

Note. Flight crews should respond to UM137 (Confirm Assigned Route) with a downlink report DM40 (Assigned Route) which provides the active route from the FMS. CPDLC free text or HF voice should not be used as this negates the automatic conformance monitoring and increases controller workload.

Note. Some International General Aviation aircraft may not support DM40. In this case, additional coordination with the aircraft manufacturer/IBAC/NAT ANSPs will be required.

Note. For those systems which do not automatically ARM the CPDLC level report, care should be taken when manually arming the level report to not select the prompt to send the report immediately.

Note. Aircraft operators with capable avionics may want to consider reconfiguring the avionics to continuously use SATCOM in those areas of the world with intermittent VHF coverage. Use of VHF in those areas may degrade data link performance.

Note. Aircraft operators are encouraged to submit DLMA problem reports for any occurrences of CPDLC uplink message non-delivery or any CPDLC uplink message delayed by more than 300 seconds (5 minutes).

Note. Aircraft Operators should ensure that the correct CODE and Call Sign are used for ADS-B operation.

Note. Aircraft operators should establish voice communications with the aeronautical radio communications stations at the expected time.

Note. Operators are encouraged to complete available aircraft upgrades as soon as possible to improve data link performance.

Note. Gander and Shanwick no longer initiate data link connection with those flights that do not indicate data link capability in the flight plan.

Decisions Required:

To make decisions on the timely acquisition of equipment, degree of training and certification required to meet the requirements to efficiently continue accessing airspace.