International Civil Aviation Organization

FIRST MEETING OF THE SURVEILLANCE IMPLEMENTATION COORDINATION GROUP (SURICG/1)

Bangkok, Thailand, 21 - 22 April 2016

Agenda Item 3: **Review of outcomes of relevant meetings**

REVIEW OUTCOME OF APANPIRG26 AND CNS SG19 ON SURVEILLANCE

(Presented by the Secretariat)

SUMMARY

This paper reviews the outcome of APANPIRG/26 and CNS SG19 on surveillance Nineteenth meeting of CNS Sub-group of APANPIRG. This similar information was also provided to ADS-B SITF/15 meeting under WP/02.

1. INTRODUCTION

1.1 APANPIRG/26 meeting held from 7-10 September 2015 in Bangkok, Thailand reviewed Surveillance related information including the outcome of the Fourteenth Meeting of the Automatic Dependent Surveillance – Broadcast (ADS-B) Study and Implementation Task Force (ADS-B SITF/14) and an ADS-B Seminar held in April 2015 in New Zealand.

1.2 The CNS SG/19 meeting also reviewed surveillance related information and recommended for the establishment of Surveillance Implementation Coordination Group.

2. DISCUSSION

Outcome of CNS SG/19 on Surveillance

2.1 The CNS SG/19 meeting reviewed the report of the Fourteenth Meeting of the Automatic Dependent Surveillance – Broadcast (ADS-B) Study and Implementation Task Force (ADS-B SITF/14) held in Christchurch, New Zealand in April 2015 including the outcome of the Tenth meeting of SEA/BOB ADS-B Working Group held in Singapore in November 2014.

2.2 Regarding the need to study the space-based ADS-B application, the meeting noted the Decision 14/2 made by the ADS-B Task Force.

2.3 The meeting endorsed some revised Conclusions to supersede APANPIRG earlier Conclusions on ADS-B and some recommended conclusions by the ADS-B SITF.

Future work of ADS-B SITF

2.4 The ADS-B SITF meeting recalled that the Task Force had met 14 times in the past 12 years. A number of guidance materials in particular for the AIGD had been developed and then

adopted by APANPIRG from time to time to assist States in the planning and implementation of ADS-B. The Task Force would further discuss outstanding issues/tasks at its next meeting and, depending on the scale of work involved, any uncompleted tasks would be addressed by other contributory bodies of APANPIRG after its next meeting. In addition, the need for guidance on Mode S SSR planning and implementation was identified, as the region was not taking advantage of the technology that was available to improve safety and efficiency outcomes.

2.5 In view of the foregoing, the meeting agreed to the proposal of the Task Force that ADS-B SITF should meet in its present form for one more meeting in 2016 to provide the opportunity to finalize the current outstanding action items where possible, and to arrange for the transfer of action items to new body which would cover broader surveillance technologies including ADS-B, and SSR Mode S and Multilateration applications. The next meeting of the ADS-B SITF would be a back to back meeting with a new surveillance body.

2.6 In this connection, the meeting reviewed and agreed to the draft Terms of Reference for a broader "Surveillance Implementation Coordination Group (SURICG)". Consequently, the meeting formulated following draft Decision:

Draft Decision 19/18 - Surveillance Implementation Coordination Group

That, the Surveillance Implementation Coordination Group (SURICG) be established with Terms of Reference provided in **Appendix K** to this Report.

2.7 It was also suggested that SEA/BOB ADS-B WG which currently reports to ADS-B SITF would report to APANPIRG through SURICG from 2017 onwards.

Australian and New Zealand Use of Downlink Aircraft Parameters DAPs

2.8 The meeting noted that Australia and New Zealand presented information at ADS-B SITF/14 meeting describing the plan to utilize SSR Mode S Downlink Aircraft Parameters (DAPs). Mode S radars had the ability to interrogate 'registers' in Mode S SSR transponders to obtain useful information for ATC. Some ADS-B transmissions included the same information. Information already available from a large number of aircraft included Flight ID, selected vertical intention (pilot or FMS selected level and barometric pressure setting), track and turn report (roll angle, true track angle, groundspeed, track angle rate and true airspeed), heading and speed (magnetic heading, indicated airspeed, Mach no., true airspeed and inertial vertical velocity).

Surveillance Data sharing between India and Myanmar

2.9 India and Myanmar provided updates on their ADS-B implementation programme and readiness status for ADS-B data sharing in accordance with guidance of APANPIRG. The meeting congratulated to the States for the progress made and encourage States to overcome the identified issues to realize the data sharing in order to enhance flight safety and coverage of surveillance in the Bay of Bengal area.

2.10 IATA emphasized the importance of collaborative cooperation on surveillance sharing in South China Sea and Bay of Bengal and appreciated the efforts made by States and congratulated for the achievement made.

Surveillance Strategy Review

2.11 The meeting reviewed the surveillance strategy presented by the Secretariat. There were several proposed changes which had been included in draft of revised surveillance strategy provided in **Appendix L** to this Report.

2.12 New Zealand added that the current strategy does not recognise the need for contingency surveillance systems. This should be a strategic consideration for states and regions when implementing modernised surveillance systems. The strategy makes the statement that the adoption platform based surveillance options will facilitate a reduced reliance on primary radar. The residual reliance on primary radar will be different for each state as the likes of ADS-B technology has system wide implications. New Zealand will take cognisance of the strategy when implementing a modernised surveillance system to meet our specific needs.

2.12.1 Additionally - This meeting has expressed a view that the use MODE S data (especially DAPS) from SSR's is desirable. That being the case then the use of such data has to be applicable to ADS-B ground systems as well. Providing such data to enhance both safety net processing and aircraft trajectory within the ATM needs to be provided by both systems to ensure completeness and consistency.

2.13 IATA recommended that the revised surveillance strategy should also consider the requirement for aircraft tracking as the new SARPs for aircraft tracking would soon become available.

2.14 Considering the proposed new SURICG is likely to meeting in the first half of 2016 if APANPIRG approved its establishment. Therefore, the meeting agreed to refer the surveillance strategy with comments by the meeting to the new SURICG for them to review as it would be one of the deliverables in the proposed draft TOR of the group.

Outcome of APANPIRG/26 on Surveillance including ADS-B

2.15 The APANPIRG/26 meeting noted the updates of implementation activities by States and developments and some issues observed during implementation of ADS-B in the Region. The actions taken by APANPIRG/26 meeting on ADS-B related matters are highlighted below.

2.16 The meeting noted that an ADS-B Seminar was held in conjunction with the ADS-B SITF/14 meeting which provided an opportunity for sharing information and experience focused on mandating carriage/operational use of ADS-B from regulators; airframe and avionics manufacturers; air space users' perspective; system/equipment suppliers, and Air Navigation Service Providers.

2.17 The meeting adopted Conclusion on Amendment to AIGD

Conclusion APANPIRG/26/40 – Amendment to ADS-B Implementation and Operations Guidance Document (AIGD)

That, the consolidated amendment to the AIGD provided in **Appendix H to** WP/9 is adopted.

(Follow-up State Letter T 8/10.21:AP146/15 (CNS) dated 24 September 2015)

2.18 Noting Section 5.1.2 of AIGD regarding a need for State to establish an Implementation Team to ensure international coordination, IBAC stated that the tasks listed in the section provide good guidance for States that plan to implement ADS-B in sovereign airspace, and it is important that States cooperate with neighbors with contiguous airspace. It may also need to provide guidance to those States that may have ANS responsibilities over the high seas or in international airspace. IBAC offered its assistance in developing some draft text for consideration by appropriate bodies of APANPIRG.

Operational Approval for Receiving ADS-B Surveillance Service

2.19 APANPIRG/25 held in September 2014 did not adopt the second part of the draft Conclusion formulated by ADS-B SITF/13 meeting i.e. "States in the Asia and Pacific Regions may choose to require or not require an Operations Specification or Operations Approval for ADS-B OUT". The ADS-B SITF/14 meeting further discussed this issue including the outcome of ad hoc working group and SEA/BOB ADS-B WG. As a result of discussion, the APANPIRG/26 adopted following Conclusions:

Conclusion APANPIRG/26/41 – Approval and Monitoring Requirements for Operation using ADS-B

That, States:

a) do not require operational approval for the operational use of ADS-B OUT by ATC;

b) note that operational approval may be required for ADS-B IN applications where there is a safety case;

c) monitor ADS-B transmissions from aircraft and take action to ensure compliance with Regional Supplementary Procedure MID/ASIA Section 5.5; and

d) provide capabilities to either:

- reject ADS-B data from aircraft which are known to transmit misleading ADS-B data until corrective actions have been successfully conducted; or

- implement procedures to ensure that such aircraft are safely managed.

Conclusion APANPIRG/26/42 – Template for Promulgation of ADS-B Avionics Equipage Requirements

That, based on APANPIRG Conclusion 20/54, States intending to implement ADS-B based surveillance service for a defined airspace and having not published regulations be urged to promulgate mandating rules for ADS-B Avionics Equipage Requirements as soon as possible using the following template:

On and after dd/mm/yyyy, if an aircraft operates on airways (insert routes)……at or above FLXXX……(or in defined airspace boundaries ……. at or above FLXXX):

the aircraft must carry serviceable 1090 MHz ES ADS-B transmitting equipment that has been certificated as meeting EASA AMC 20-24, or FAA AC No. 20-165A – Airworthiness Approval of ADS-B, or meets the equipment configuration standards in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia.

Note: This Conclusion supersedes APANPIRG Conclusion 21/39 (i.e. removes any requirement for operations approval)

Conclusion APANPIRG/26/43 – Guidelines for Airworthiness Approval for ADS-B Avionics Equipage

That, States be advised to use the guidelines provided in **Appendix I** to WP/9 for Airworthiness Approval for ADS-B OUT Avionics Equipage.

Note: This Conclusion supersedes APANPIRG Conclusion 21/40

(Follow-up State Letter T 8/10.21:AP154/15 (CNS) dated 02 October 2015)

Enhancing Aviation safety through Establishment of a Regional ADS-B Avionics Problem Report Database (APRD)

2.20 The meeting noted the latest satisfactory progress in establishment of a Regional ADS-B Avionics Problem Reporting Database (APRD) in collaboration with the ICAO Regional Sub-office (RSO). During 51st DGCA Conference held in November 2014, Hong Kong China presented a paper outlining a proposal on the establishment of the Regional APRD for sharing the analysis results with a view to enhancing aviation safety for the Region. The proposal gained support from the Conference. The demonstration made by Hong Kong China at the Task Force meeting included the work flow of problem reporting and phases of processing, and also the roles of the reporting Administration/ANSP, ICAO, verifying and follow-up parties, as well as a prototype of the database and human-machine interface (HMI) design. The APRD will contain useful information on the generic ADS-B avionics performance problem commonly encountered in the Region. The APRD is being posted on an ICAO secure website, with States/Administrations requesting access required to nominate registered points-of-contact, who would be notified whenever there were updates to the APRD.

Regional ADS-B Requirement for New Aircraft

2.21 ADS-B SITF proposed the revised wording for an Asia/Pacific Region ADS-B forward fitment commencing in 2018. It was pointed out that as the lowest cost of fitment of ADS-B was during manufacture, the proposal would allow the avoidance of later retrofit costs, bringing long term savings to the aviation community without any significant cost in the short term. While the Asia/Pacific Region had taken the pragmatic view of ADS-B implementation using DO-260 and DO-260A, implementation of DO-260B would leverage off the Europe (from 2016) and FAA mandates (from 2020 not only for forward fit) and promote global harmonization. Mandates for forward fit would minimize the economic burden on aircraft operators, as it would not apply to existing aircraft.

2.22 Defining a forward fit mandate according to the date of issue of a certificate of airworthiness could result in the mandate being applied to an imported aircraft that is quite old. Mandates determined by date of manufacture were a better option. The meeting noted that the overall purpose was to commence the transition to a DO-260B environment by applying only to newly manufactured aircraft from a defined future date. Accordingly, the APANPIRG/26 adopted the following Conclusion:

Conclusion APANPIRG/26/44 – ADS-B OUT Forward Fit Equipage

That, States/Administrations in APAC Region be strongly encouraged to mandate that registered aircraft with a maximum certified take-off mass exceeding 5 700 kg or having a maximum cruising true airspeed capability greater than 250 knots, with a date of manufacture on or after 8 June 2018 (two years after the European forward fitment mandate is effective) be equipped with ADS-B avionics compliant with Version 2 ES (equivalent to RTCA DO260B) or later version.

(Follow-up State Letter T 8/10.21:AP162/15 (CNS) 30 October 2015)

2.23 The meeting noted with appreciation the updated ADS-B implementation status in the APAC Region provided in **Appendix A** to this paper. The status was further updated at SEA/BOB ADS-B Working Group in November 2015. This meeting is expected to further update the information contained in Appendix A.

Future work of ADS-B SITF

2.24 The ADS-B SITF meeting recalled that the Task Force ad met 14 times in the past 12 years. A number of guidance materials in particular for the AIGD had been developed and then adopted by APANPIRG from time to time to assist States in the planning and implementation of ADS-B. The Task Force would further discuss outstanding issues/tasks at its next meeting and, depending on the scale of work involved, any uncompleted tasks would be addressed by other contributory bodies of APANPIRG after its next meeting. In addition, the need for guidance on Mode S SSR planning and implementation was identified, as the region was not taking advantage of the technology that was available to improve safety and efficiency outcomes.

2.25 In view of the foregoing, the meeting agreed to the proposal of the Task Force that ADS-B SITF should meet in its present form for one more meeting in 2016 to provide the opportunity to finalize the current outstanding action items where possible, and to arrange for the transfer of action items to new body which would cover broader surveillance technologies including ADS-B, and SSR Mode S and Multilateration applications. The next meeting of the ADS-B SITF would be a back to back meeting with a new surveillance body.

2.26 In this connection, the meeting reviewed and agreed to the draft Terms of Reference for a broader "Surveillance Implementation Coordination Group (SURICG)". Consequently, the APANPIRG/26 adopted following Decision:

Decision APANPIRG/26/45 – Surveillance Implementation Coordination Group

That, the Surveillance Implementation Coordination Group (SURICG) be established with Terms of Reference provided in **Appendix K** to WP/9.

2.27 It was decided that SEA/BOB ADS-B WG which currently reports to ADS-B SITF would report to APANPIRG through SURICG from 2017 onwards.

Update on the ADS-B Collaboration Project in the South China Sea

2.28 Singapore presented the paper on the collaborative efforts of States to achieve a seamless ADS-B surveillance coverage over a portion of the South China Sea area with the aim of improving safety, capacity and efficiency. The meeting noted the progress of the collaborative efforts of Indonesia, Singapore and Viet Nam to achieve seamless ADS-B surveillance coverage over a portion of the South China Sea area.

2.29 Singapore and Viet Nam had agreed on a progressive phased approach to reduce longitudinal separation on specified ATS routes to allow airspace users the optimum benefits of ADS-B. From the previous 50 NM longitudinal separation, the minimum separation would be reduced to 20NM over 3 phases commencing in December 2013 and planned to be completed at the end of 2015.

Surveillance Data sharing between India and Myanmar

2.30 India and Myanmar provided updates on their ADS-B implementation programme and readiness status for ADS-B data sharing in accordance with guidance of APANPIRG. The meeting congratulated to the States for the progress made and encourage States to overcome the identified issues to realize the data sharing in order to enhance flight safety and coverage of surveillance in the Bay of Bengal area.

2.31 With reference to the need to formulate ADS-B performance standards for any future space-based ADS-B implementation, the ADS-B SITF/14 meeting endorsed the following Decision:

Decision ADS-B SITF 14/2 – Study the application of space based ADS-B

That, the ADS-B SITF or its alternate body to:

a) study the application of space-based ADS-B in the Asia Pacific region; and

b) focus on regional aspects, develop recommendations on implementation of ADS-B delivered from space-based platforms, and on required performance standards.

2.32 Regarding the performance requirement for the space based ADS-B service, the meeting also considered that it is a global issue therefore it would be more appropriate to refer it to ICAO Headquarters for further action.

2.33 The meeting also noted that the Terms of Reference of SEA/BOB ADS-B WG had been amended by the Working Group to include the identification of implementation issues and proposal of solutions for the identified issues.

2.34 Singapore had presented their monitoring result for ADS-B stations and the avionics to the WG meeting. Singapore had shared that about 90% of the ADS-B equipped airframes were equipped with DO-260 avionics, about 6% were equipped with DO-260A avionics and 4% were equipped with DO-260B avionics.

3. ACTION BY THE MEETING

3.1 The meeting is invited to the information provided in this paper.

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