International Civil Aviation Organization

The Second Meeting of the Asia/Pacific Air Traffic Management Automation System Task Force (APAC ATMAS TF/2)

Video Tele-Conference, 14 - 16 September 2021

Agenda Item 2: Review Outcomes of Relevant Meetings

OUTCOMES OF THE SIXTH MEETING OF THE SURVEILLANCE IMPLEMENTATION COORDINATION GROUP (SURICG/6)

(Presented by the Secretariat)

SUMMARY

This paper presents the outcomes of the Sixth Meeting of the Surveillance Implementation Coordination Group (SURICG/6) for information and action.

1. INTRODUCTION

1.1 The Sixth Meeting of the Surveillance Implementation Coordination Group (SURICG/6) was held from 24 to 27 August 2021 via video teleconference. The meeting was attended by 116 participants from 19 States/Administrations, 4 International Organizations, 1 aircraft manufacturer, and 1 service provider from industry (IATA, ICCAIA (Aireon), IFATCA, RTCA, Boeing and PCCW Global). The meeting report, working papers, information papers and other resources can be accessed at https://www.icao.int/APAC/Meetings/Pages/2021-SURICG-6.aspx .

1.2 This paper summarized relevant information and updates from the meeting.

2. DISCUSSION

2.1. The summary of discussion in the meeting is given in following paragraphs.

Outcome of Relevant Meetings on Surveillance (WP/02) - Sec

2.2. The meeting reviewed relevant information and updates on Surveillance arising from SURICG/5, CNS SG/24 an APANPIRG/31.

Review Report of Mode S DAPs WG/4 (WP/03) - Sec

2.3. This paper summarized relevant information and updates with the highlight on the reviewed outcomes of Mode S DAPs WG/4 meeting, which was held via video Tele-conference from

29 to 31 March 2021. The paper discussed major Draft Conclusions/Decisions proposed by DAPs WG/4 for consideration of SURICG/6. The DAPs WG/4 meeting report, working papers, information papers, and other resources can be accessed at https://www.icao.int/APAC/Meetings/Pages/2021-DAPs-WG4.aspx

2.4. The SURICG/6 meeting reviewed the proposal to amend APANPIRG Conclusions related to II codes and extend the consideration to the use of SI codes. After discussion, the following Draft Conclusion was adopted by the meeting for consideration in CNS SG/25:-

<table>
<tr><td colspan="2">Draft Conclusion SURICG/6/1 (Draft Conclusion DAPs WG/4/1, Draft Conclusion DAPs WG/4/2, Draft Conclusion DAPs WG/4/3) - Interrogator Code (IC) Planning and Coordination</td></tr>
<tr><td>What: That,

With the need to extend the Use of Surveillance Identifier (SI) in Interrogator Code (IC) on top of Interrogator Identifier (II), the relevant APANPIRG Conclusions are updated as follows:-

Coordination Process for SSR Mode S Interrogator Code (IC)
(formerly Conclusion 19/40)

a) in view of the increasing density of SSR interrogator installations in the region, and that States have varying readiness to extend from Interrogator Identifier (II) to both Interrogator Identifier and Surveillance Identifiers (SI) codes, there will be a period whereby both II and SI will be used.

b) while implementing SSR Mode S, States should take into account following issues while assigning IC for these installations:
• for planning the implementation of SSR Mode S interrogators, administrations should ensure that the interrogators with overlapping coverage are not operating with the same IC.
• where, the coverage of the interrogator extends beyond the boundaries of the State, The IC should be worked out in coordination with the ICAO Asia and Pacific Office and the neighboring States concerned, and
• administrations should inform the ICAO Asia and Pacific Office about the assigned IC for these installations.

Coordination Requirements for SSR Mode S Interrogator Codes (IC)
(formerly Conclusion 20/56)

States be advised to provide the following information on SSR Mode S Interrogator Code to the ICAO Asia/Pacific Office for coordination and registration.

a) Name of country/territory and location of facility;
b) Antenna Coordinates (Latitude and Longitude);
c) Elevation of antenna above the Mean Sea Level (MSL) in meters;
d) Maximum Coverage of SSR Mode S Interrogator in nautical mile;
e) II Code (1 to 15) or SI Code (1 to 63); and
f) Remarks (special configuration such as radar clustering, lockout override, II/SI mode capability)

Planning Criteria for SSR Mode S Interrogator Code (IC) Assignment</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
</table>

(formerly **Conclusion 20/57***)* The planning criteria for SSR Mode S IC coordination and assignment as provided in Appendix J of Doc 9924 (Third Edition, 2020) be adopted for use in the Asia/Pacific Region.	
Why: Due to higher density of radars, some States are facing a shortage of II codes. It has to be solved by transiting from II to SI code. It is noted that state may use a mixture of II and SI codes before complete migration to SI code. The assignment of interrogator codes (IC), where necessary in areas of overlapping coverage, across international boundaries of flight information regions, shall be the subject of regional air navigation agreements. States still have to coordinate with ICAO APAC Regional Office on the allocation of II codes and SI codes.	Follow-up: ☒Required from States
When: 02-Dec-2021	Status: Draft to be adopted by PIRG
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SURICG	

*Note: This draft conclusion will supersede **APANPIRG Conclusions 19/40, 20/56 and 20/57** once adopted.*

2.5. In association, the *Table for SSR Mode S Interrogator Code Coordination* was reviewed to be modified as provided in the template in **Appendix A** to the report of the meeting. It was reported that Chairpersons of DAPs WG and the ICAO secretariat approached the Surveillance Panel about the addition of SI code allocation criteria into Doc 9924, and DAPs WG will work to reflect the required updates in Mode S DAPs IGD.

2.6. The SURICG/6 meeting reviewed the strategy of transition from II code to II and SI mixed code and the following Draft Conclusion was adopted by the meeting for consideration in CNS SG/25:-

Draft Conclusion SURICG/6/2 *(DAPs WG/4/4)* - Transition from II code to II and SI mixed code	
What: States with Mode S radar capable of performing II/SI mode operations are encouraged to transit from II code to II and SI mixed code, so as to ease the shortage of II codes. States planning to perform the transition shall coordinate with ICAO APAC Regional Office to obtain the SI codes.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: Due to higher density of radars, some States are facing a shortage of IC codes, which has to be solved by transiting from II to II and SI mixed code. It is noted that radars using II and SI codes can co-exist, hence there is no need for a big bang approach. However, States still have to coordinate with ICAO APAC Regional Office on the allocation of SI codes.	Follow-up: ☐Required from States
When: 02-Dec-2021	Status: Draft to be adopted by PIRG
Who: ☐Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: SURICG	

2.7. The DAPs WG/4 revised the Regional Roadmap for Mode S Implementation, which covered the topics including Mode S mandates, use of SI Codes, radar clustering, use of conspicuity

code, mandating weather reporting capability, datalink map and monitoring of 1030 and 1090 MHz usage. The SURICG/6 meeting reviewed the revised Regional Roadmap provided in **Appendix A** to this paper and further noted that the use of conspicuity code has already been endorsed in ATM SG/6, and ATMAS/TF was identified to be the appropriate forum to discuss the implementation on conspicuity code as the Region will need its automation systems to be able to support the feature. With aforementioned, the meeting adopted the following Draft Conclusion for the consideration of CNS SG/25 meeting:

<table>
<tr><td colspan="3">Draft Conclusion SURICG/6/3 (DAPs WG/4/5) - The APAC Regional Roadmap for Mode S Implementation</td></tr>
<tr><td colspan="2">What: That, the APAC Regional Roadmap for Mode S Implementation provided in Appendix B to the Report be adopted.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: The revised Roadmap defined the scope and rational steps for the implementation of Mode S in APAC region.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 22-Oct-2021</td><td colspan="2">Status: Draft To be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SURICG</td></tr>
</table>

2.8. A proposal for revised draft Edition 3.0 of the Mode S DAPs Implementation and Operations Guidance Document (IGD) was discussed in SURICG/6. The main amendments include advice to mandating Mode S transponder, other protocols for DAPs extraction, use of parameters in the ATM automation system, Mode S DAPs application examples and identified issues, and Mode S radar parameter information. SURICG/6 adopted the following Draft Conclusion for the consideration of CNS SG/25 meeting:

<table>
<tr><td colspan="3">Draft Conclusion SURICG/6/4 (DAPs WG/4/6) - Mode S DAPs IGD 3.0</td></tr>
<tr><td colspan="2">What: That, the Mode S DAPs Implementation and Operation Guidance Document Edition 3.0 provided in Appendix C to the Report be adopted.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Editorial correction and revision to reflect regional updates in implementation.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 22-Oct-2021</td><td colspan="2">Status: Draft to be adopted by Sub-Group</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SURICG</td></tr>
</table>

2.9. EUROCONTROL published the System Area Codes (SAC) for the various regions except for Asia Pacific. The DAPs WG/4 meeting discussed the considerations to publish the Asia Pacific SAC at the EUROCONTROL website. ICAO APAC also keeps track of the SIC allocation within the States which States have their own control over the use of SIC and may change overtime without the need for ICAO APAC to manage. As such the following Draft Conclusion was endorsed by the SURICG/6 meeting for consideration of CNS SG/25:

Draft Conclusion SURICG/6/5 *(Draft Conclusion DAPs WG/4/7 and Draft Decision DAPs WG/4/8)* - Revision of the Regional Supplement to ASTERIX Interface Control Document (ICD)

<table>
<tr><td colspan="2">What: ICAO APAC Regional Office to:-
a) update EUROCONTROL with the latest SAC allocation within Asia Pacific; and

b) to coordinate the allocation of SAC within Asia Pacific and not the SIC.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td colspan="2">Why:
a) EUROCONTROL published the SAC for all the regions except Asia Pacific. It is believed that the publication will be beneficial to the developers of future message protocol and surveillance related applications.

b) SIC is managed by State and there is little value for ICAO APAC to manage the SIC. Considering the workload to manage the SIC and the negligible benefits, it is proposed that ICAO APAC not to manage SIC.</td><td>Follow-up:
☐Required from States</td></tr>
<tr><td>When: 22-Oct-2021</td><td colspan="2">Status: Draft to be adopted by Sub-Group</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SURICG</td></tr>
</table>

Report on Survey on Current use and Future planning of Mode S Enhanced Surveillance (EHS) Implementation (WP/08) - Sec

2.10. The Mode S DAPs WG/4 resulted into an Action Item on conducting a *Survey on Current use and Future planning of Mode S Enhanced Surveillance (EHS) Implementation* to the Member States. Additionally, a separate questionnaire were sent to IATA to respond to the question related to ELS Mode S capability and EHS Mode S capability of commercial fleets in APAC region. ICAO APAC Office received response from twelve (12) Member States with the graphical representations of responses received from States and IATA were provided in appendix to the paper. The outcomes of the survey conclude that most States are not facing any challenges in implementing APANPIRG/31/14 Conclusion. Additionally, the commercial fleet in APAC, North America, and MENA are already possess Mode S ELS and EHS Mode S capability. IATA expressed gratitude to ICAO Secretariat for the survey outcomes presentation and informed that they are satisfied by the outcomes. EHS provides additional information, such as track angles, to ATM Automation Systems for better situation awareness for ATC.

Status on the Updates to the Mode S SI/II Codes Assignment Criteria in Doc 9924 by China, Japan, Singapore and Secretariat (IP/02)

2.11. As Doc 9924, Aeronautical Surveillance Manual does not contain sufficient information to help APAC region to plan the implementation of II and SI mixed code environment, a small working party comprising of representatives from China, Japan, Singapore, and ICAO Secretariat were formed in DAPs WG/4 to amend the Doc 9924 to provide necessary guidance material. A proposal was submitted to the Surveillance Panel- Aeronautical Surveillance Working Group (SP-ASWG) to initiate the review of the Doc 9924 on the portion of II and SI code allocation. Subsequently, the working party generated two papers to Aeronautical Surveillance Working Group-Technical Subgroup (ASWG-TSG), which address the elements to be considered when introducing SI code assignments in the APAC Region, considering that during the transition phase not all aircraft may be equipped with SI capable transponders. ASWG-TSG agreed to include the technical material presented in these papers and it will be reviewed in next ASWG-TSG meeting in first quarter 2022. Furthermore, the paper proposed that the DAPs WG continue work on this matter in parallel with the Surveillance Panel, based on the relevant material in Doc 9924 with the view to improve current guidance in the Appendices H and J of Doc

9924. The results from DAPs WG may be presented to the Surveillance Panel (SP) as draft updates to Doc 9924.

Review Report of the First Meeting of the Surveillance Study Group (SURSG/1) (WP/04) - Sec

2.12. This paper summarized relevant information and updates with the highlight on the reviewed outcomes of SURSG/1 meeting held via video tele-conference from *20 to 22 April 2021*. . The SURSG/1 meeting report, working papers, information papers, and other resources can be accessed at https://www.icao.int/APAC/Meetings/Pages/2021-SURSG-1.aspx.

2.13. Based on the recommendation of SURSG/1, SURICG/6 adopted the following Draft Decision for the consideration of CNS SG/25:

<table>
<tr><td colspan="3">Draft Decision SURICG/6/6: Revised ToR of Surveillance Study Group (SURSG)</td></tr>
<tr><td colspan="2">That, the Revised Terms of Reference of the Surveillance Study Group (SURSG) provided in Appendix D to the Report be adopted.</td><td>Expected impact:
☐ Political /Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: The SURSG/1 meeting reviewed the ToR and made amendments on adding chair role and function, frequency of the meeting of SURSG and the mode of the various task lead meetings for effective progress update, decision making, work assignments as they arise and the need to update the list of contributing States as necessary.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 22-Oct-2021</td><td colspan="2">Status: Draft to be adopted by Sub-Group</td></tr>
<tr><td colspan="3">Who:☒Sub groups ☐ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐APANPIRG ☐ Other:</td></tr>
</table>

2.14. The meeting discussed that as per ToR, SURSG shall complete four deliverables within its term. For each of the deliverables, a list of sub-tasks were identified for elaborating its required work content and facilitate the work sharing by Member States. The agreed work plan with focal point of voluntary Administrations/Organization was provided in Appendix to the paper.

Proof-of-concept for Surveillance data sharing on SWIM by Surveillance Study Group (SURSG) (WP/12) - Hong Kong, China on behalf of SURSG

2.15. Hong Kong, China proposed a proof-of-concept (POC) for surveillance data sharing on SWIM to be conducted in Hong Kong China. The meeting was informed the tasks for the study group were grouped under two stages, namely feasibility study stage and recommendation stage. In parallel with the feasibility study, Hong Kong China plans to have a POC conducted by sharing ADS-B data collected in Hong Kong on a simulated SWIM EMS over CRV based on a hybrid infrastructure model, which is a mix of "Distributed Model" with ANSPs operating their own EMS and the "Centralized Model" with ANSPs accessing centralized SWIM services. The POC was explained by a high-level system block diagram in the paper. The meeting expressed support to the POC and on-going work of the SURCG. Hong Kong China is working with the CRV provider, PCCW Global, on a POC demonstration, which is planned to take place in 2022.

Proposed Concept of Operations for Surveillance Data Sharing (IP/17) – Singapore, Hong Kong China, Thailand, and Viet Nam

2.16. As the outcome of Sub-task 2.1 of SURSG work plan, the paper described the proposed Concept of Operations (CONOPS) for sharing of surveillance data among multiple parties using platform such as SWIM along with the objective of the CONOPS, so as to solicit suggestions/concerns from SURICG for consideration by SURSG in formulating the CONOPS.

Review of Regional Requirements for Surveillance in APAC e-ANP and Seamless ANS Plan (WP/05) – Sec

2.17. ICAO Secretariat reviewed the origins of APANPIRG Conclusions and consolidated the Regional surveillance requirements specified in the Regional e-ANP and the Seamless ANS Plan (Version 3.0, November 2019) in this paper. The meeting noted that the next review year for the Asia/Pacific Seamless ANS Plan is scheduled for 2022.

Update on Regional Supplement to ASTERIX Interface Control Document (ICD) for ASIA/PAC Region (WP/06) – Sec

2.18. ICAO Secretariat presented the recent updates to the Regional Supplement to ASTERIX ICD for ASIA/PAC Region ("the Supplement") and introduced the planning criteria and current usage of SAC in APAC region. The meeting was informed that with the actual or planned increase in number of sensors/systems going over 256 distinct SICs allocable to assigned SAC for a State/Administration/Territories, it might need to apply for additional SAC(s) to cater the need to identify distinctly of its sensors/systems. Meeting noted that current allotments would be enough to cater the actual and planned increase of surveillance sensors and automation systems in the APAC Region. The meeting agreed to use surveillance and automation systems in the Supplement at the place of "radars". ICAO Secretariat proposed changes in wordings which was reviewed and endorsed in the meeting as Appendix E to the meeting report in tracked change mode.

The SAC SIC Code Allocation Management and Planning in China (IP/22) – China

2.19. China introduced the allocation management and future planning of SAC and SIC codes in China due to their forward planning from the construction plan for ATMB of CAAC during the 14th Five Year Plan period (2020-2025) and the professional plan of CNS for the next ten years (2020-2030). The meeting was informed that due to the forward planning, China had applied to ICAO APAC Office for the allocation of additional SACs and ICAO APAC Office has assigned accordingly after review.

Inconsistent ICAO Aircraft Address and Target identification Between ADS-B Data and Flight Plan (WP/11) - Hong Kong China

2.20. Hong Kong China presented the observation on recurring inconsistencies of ICAO Aircraft Address and Target Identification between ADS-B data and flight plan for some aircraft flying within Hong Kong Flight Information Region. Hong Kong China expressed such issues has not only caused safety implications to ATC operation but also induced additional workload to both air traffic controllers and to supporting staff for following up with the concerned airlines proactively. As such, the paper proposed the following Draft Conclusion which was endorsed in SURICG/6 for further consideration of CNS SG/25:

Draft Conclusion SURICG/6/7 - Integrity of ICAO Aircraft Address and Target Identification in ADS-B / MLAT / Mode S Data and Flight Plan	
What: To urge States/Administrations to proactively follow up with air operators to address discrepancies of ICAO Aircraft Address and Target Identification between ADS-B / MLAT / Mode S data and flight plan.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic

	☐ Environmental ☒ Ops/Technical
Why: Such discrepancies will cause safety implications in ATC operation and induce additional workload to controllers and supporting staff in handling the cases.	Follow-up: ☒Required from States
When: 22-Oct-2021	Status: Draft to be adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

Status of Space-based ADS-B (IP/09) –Aireon/ICCAIA

2.21. Aireon presented status of space based ADS-B as a service which has been operational for some time. The working mechanism of space based ADS-B were explained and it was informed that EASA has certified Aireon as an ANSP for the provision of operational surveillance data. It was added that Doc 4444 has been updated to allow reduced oceanic separation using Space based ADS-B with CPDLC and some ANSPs is performing tests on the reduced oceanic separation. Aireon informed that the costs of space based ADS-B vary depending on the application/operational use and operational benefit and Space based ADS-B has the potential to complete the coverage picture even in States that have significant ground based radar or terrestrial ADS-B. Meeting noted that space based ADS-B was provided into APAC CRV network since 2020 and it is currently supporting Papua New Guinea (PNG) ATC operations. An example from NiuSky Pacific was explained to illustrate the benefits.

ICAO Surveillance Panel Activities (IP/11) – ICAO Surveillance Panel

2.22. This paper updated the SURICG/6 meeting about the information and discussions from the most recent meetings of the SP-ASWG/13 and the SP-AIRBWG/11, both in April 2021. It was informed that SP-ASWG/13 considered a Proposal for Amendment (PfA) to Annex 10 Volume III for Allocation of additional 24-bit Aircraft Addresses for of all States that currently are allocated 1024 addresses, for which the proposal to be presented to the Communications Panel (CP) and Data Communications Infrastructure Working Group (DCIWG) for their comments. The feedback on this PfA is hoped to be processed in Fourth Meeting of Surveillance Panel (SP/4) in spring 2022. SP-ASWG/13 also discussed the plans for creating a consequential Change Proposal to Doc 9871, "Technical Provisions for Mode S Services and Extended Squitter.", and the 1030/1090 MHz congestion mitigation methods and data from various 1030/1090 MHz measurement campaigns in various ICAO States around the world. The planned SP Working Group meetings in 2022 and 2023 are listed and it was added that SP/5 will consider several PfAs to Annex 10 Volume IV to align SARPs with the latest EUROCAE/RTCA avionics standards for Mode S transponders with Extended Squitter (ADS-B Version 3), ADS-B IN systems with applications including IM, and additional variants of ACAS X.

Update on air traffic control surveillance activities in Australia (IP/10)

2.23. Australia presented updates on Australia's ATC surveillance activities. Aside of updates on surveillance infrastructure, Australia informed about a trial ground surface movement situational awareness system and a work on low cost ADS-B avionics for VFR and added that future joint Civilian/Military Australia wide ATM system will provide a "Multi Sensor" surveillance tracking function, incorporating ADS-B, radar and WAM inputs. Lastly, Australia added that it is about to approach the market with a request for proposal for an Integrated Drone Surveillance System Trial, aiming to demonstrate existing market capability in drone detection and surveillance along with associated data management, tracking and display and control systems.

Update on Surveillance Activities in Thailand (IP/21)

2.24. This paper introduces the surveillance activities including sensors and ATM automation system implementation in Thailand. Aside updates on surveillance infrastructures and mandates implemented, the paper also introduced nation-wide ATM automation system replacement project, Thailand Modernization CNS/ATM System (TMCS) and that Bangkok ACC is currently implemented AIDC with Kuala Lumpur ATCC Vientiane ACC and Phnom Penh ACC.

Review SURICG ToR with integration of SEA/BOB ADS-B WG ToR (WP/10) - Sec

2.25. SURICG ToR was reviewed in the meeting in the view of integration of SEA/BOB ADS-B WG ToR into it. As the result of review, the SURICG ToR was found necessary to be updated and the following Draft Decision was adopted in the meeting for consideration in CNS SG/25:-

Draft Decision SURICG/6/8: Revised ToR of Surveillance Implementation Coordination Group (SURICG)	
That, the Revised Terms of Reference of the Surveillance Implementation Coordination Group (SURICG) provided in **Appendix M** to the Report be adopted.	Expected impact: ☐ Political /Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The ToR from dissolved SEA/BOB ADS-B WG was reviewed and necessary updates were identified.	Follow-up: ☐Required from States
When: 22-Oct-2021	Status: Draft to be adopted by Sub-Group
Who:☒Sub groups ☐ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐APANPIRG ☐ Other:	

Review ADS-B Implementation and Operations Guidance Document (AIGD)

2.26. Hong Kong China led the discussion and incorporation of materials to update AIGD during the meeting with amendments of the additional avionics issue on Honeywell Primus II RCZ as described in IP/07 of this meeting. The meeting agreed to formulate the following draft Conclusion for consideration by CNS SG/25 meeting.

Draft Conclusion SURICG/6/9 - Revised ADS-B Implementation and Operations Guidance Document (AIGD)	
What: That, the revised ADS-B Implementation and Operations Guidance Document (AIGD) provided in **Appendix N** to the Report, which consolidated all change proposals during SURICG/6, be adopted as Version 14.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Updates from SURICG/6	Follow-up: ☐Required from States
When: 22-Oct-2021	Status: Draft to be adopted by Subgroup
Who: ☒CNS Sub group ☐APAC States ☒ICAO APAC RO ☐ICAO HQ	

Other Papers

2.27. The SURICG/6 further reviewed different papers and presentations that focuses on various surveillance ground systems and avionics performance monitoring and improvement in compliance, as

well as updates on surveillance activities from States/Administrations, Surveillance Panel, Standards Making Organizations, and aircraft manufacturers. The list of these papers are provided as follows:-

Stocktake on Documents to Update under Agenda Item 6 (WP/13) – Sec

Planning of SURICG on SURSG Outcomes (IP/03) – Sec

Practical approach to access the performance of surveillance systems (IP/04) – Republic of Korea (ROK)

Automatic Dependent Surveillance-Broadcast (ADS-B) Out Implementation in USA (IP/05)

Performance-based Operations Aviation Rulemaking Committee (PARC) Action Team (AT) Exemption 12555 Report (IP/06) – USA

Recent ADS-B Avionics Issues Observed in the USA (IP/07)

Report on the ADS-B In Retrofit Spacing (AIRS) Evaluation Project (IP/08) – USA

Resolution of conflicting provisions in the Doc 8071 Vol III regarding Flight Inspections (IP/12) – Singapore

Updates on Mode S Interrogator Identifier (II) codes coordination in the APAC Region (IP/13) – Sec

ADS-B Equipage and Quality Performance in USA (IP/14)

New Zealand Surveillance Update (IP/15)

ATC Surveillance Activities Update in Malaysia (IP/16)

Diagnosis and Maintenance about a SSR Target Deviation Fault (IP/18) – China

A Non-Cooperative Method for DAPs Data Recognition (IP/19) – China

The Update Activity of ATC Surveillance in China (IP/20)

RTCA Standards Supporting Global Interoperability (IP/23) – RTCA

ADS-B - A Boeing Perspective (SP/01)

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) discuss how ATMAS/TF to support the implementation of conspicuity code in automation systems in the Region; and

c) discuss any relevant matter as appropriate.

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Revised Roadmap for Mode S DAPs Implementation in APAC Region

(Agreed by Mode S DAPs WG/4 and SURICG/6)

1. INTRODUCTION

1.1 The Terms of Reference for the Mode S DAPs Working Group includes the formulation of a roadmap for DAPs Application.

1.2 An initial version of the roadmap was generated at Mode S DAPs WG/3 for adopted by SURICG/6.

1.3 The topics considered in the roadmap were:

a) Mode S mandate;
b) Use of II and SI mixed Codes;
c) Radar Clustering;
d) Use of conspicuity codes;
e) Weather reporting capability; and
f) Datalink Map.

1.4 However, due to the evolving and complex nature of Mode S related technology, only the roadmap of *Mode S mandate* was adopted after some amendment.

1.5 Based on current practices around the world and taking into account the situation in Asia Pacific, the Mode S DAPs WG/4 formulated the revised version of roadmap for the Asia Pacific Region.

2. SUMMARY

The revised roadmap is summarised as follows:

S/N	Issue	Proposed Roadmap	Reasons
1	Mode S Mandate	**Conclusion APANPIRG/31/14 (CNS SG/24/13 (SURICG/5/3(DAPs WG3/1))) - Mode S Forward Fit Equipage in APAC Region** 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 1 January 2022 be equipped with Mode S avionics compliant with Enhanced Surveillance (EHS).	Considering that a number of DAPs applications will require EHS and that it's easy for new aircraft to be equipped with EHS. Retrofitting existing airframes with EHS will need further deliberation under challenging pandemic situation.
2	Use of II and SI mixed Codes	**Proposed Draft Conclusion** States with Mode S radar capable of performing II/SI mode operations are urged to transit from II code to II and	Due to higher density of radars, some states are facing a shortage of IC codes, which has to be solved by transiting from II to II and SI mixed code. It is noted that

		SI mixed code, so as to ease the shortage of II codes. States planning to perform the transition shall coordinate with ICAO APAC to obtain the SI codes.	radars using II and SI codes can co-exist, hence there is no need for a big bang approach. However, States still have to coordinate with ICAO APAC on the allocation of SI codes. Due to some aircraft still not SI code ready, only radars with II/SI mode should be allowed to use SI
3	Radar Clustering	No proposed roadmap at the moment. But States with the competency and operational requirement may consider applying such technique.	Due to complexity and cost, only Germany and the Netherlands have implemented such techniques. It is unclear whether the benefits outweigh the cost.
4	Use of conspicuity codes	Mode A = 1000 has already being assigned as the conspicuity code.	It is foreseen that the region will need the automation systems to be able to support the conspicuity code feature before Mode S address can be used in lieu of Mode A address for selected flights. There may be a need to coordinate the efforts with ATMAS TF in the region.
5	Weather reporting capability	Not practical to mandate weather reporting capability in Mode S, as there are no ready solutions to enable such capability for current transponders (i.e. versions 0, 1, and 2). States requiring such capability should consider other means to generate weather information (such as using algorithm to derive weather information).	While weather data is one of the Mode S DAPs, only very few (<1%) aircraft has this capability. The industry does not have software patches to enable this weather feature, hence there is no point having a mandate for weather capability. Instead, some States researched algorithms to derive weather information. It is foreseen that the weather reporting capability will be available in version 3 transponders
6	Datalink Map	No proposed roadmap at the moment. States are instead urged to adopt the various SARPs and guidance material relating to reduction of frequency congestion.	It is difficult to implement and enforce datalink map with no certainty of success. It is more practical to adopt the SARPs and guidance materials relating to the reduction of frequency congestion.
7	Monitoring of 1030 and 1090 MHz usage	States with capability are urged to perform RF measurement on 1030 and 1090 MHz usage. Guidance material is proposed.	It is necessary to ensure that the RF occupancy is kept at healthy levels.

Note: The roadmap may be revisited as and when necessary. It is foreseen that for the items without roadmap, they may be reviewed in 2 to 3 year time.