International Civil Aviation Organization

Sixth Meeting of the Surveillance Implementation Coordination Group (SURICG/6)

Video Teleconference, 24 – 27 August 2021

Agenda Item 2: Review outcomes of relevant meetings

REVIEW OF RELEVANT MEETINGS/WEB-CONFERENCES

(Presented by the Secretariat)

SUMMARY

This paper presents the surveillance outcomes of relevant meetings, including the Fifth Meeting of the Surveillance Implementation Coordination Group (SURICG/5), the Twenty Fourth Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/24) of APANPIRG, the Thirty First Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/31).

1. INTRODUCTION

1.1 The Fifth Meeting of the Surveillance Implementation Coordination Group (SURICG/5) of CNS SG was held from 22 September to 24 September 2020 via video teleconference. The meeting was attended by 120 participants from 20 States/Administrations and 5 International Organizations namely CANSO, EUROCAE, IATA, IFATCA, and ICCAIA, plus one service provider from Industry named PCCW Global. SURICG/5 meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2020-SURICG5-.aspx.

1.2 The Twenty Fourth Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/24) of APANPIRG was held from 30 November to 4 December 2020 via video teleconference. The meeting was attended by 176 participants from 26 States/Administrations and 5 International Organizations namely CANSO, EUROCONTROL, IATA, IFATCA and IFATSEA, plus 26 participants from industry partners. CNS SG/24 meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2020-CNS-SG24.aspx.

1.3 The Thirty First Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/31) was held from 14 to 16 December 2020 via video teleconference. The Meeting was attended by 193 participants from 23 Member States, 2 Special Administrative Regions of China, and 8 International Organizations (AAPA, ACI, CANSO, IATA, ICAO, IFALPA, IFATCA and IFATSEA). APANPIRG/31 meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2020-APANPIRG31.aspx.

1.4 This paper summarized relevant information and updates with the highlight on the reviewed outcomes of all surveillance related meetings including CNS SG/24 and APANPIRG/31.

2. DISCUSSION

2.1 The actions taken by CNS SG/24 and APANPIRG/31 meetings on surveillance related matters are highlighted below:

Outcomes of CNS SG/24

2.2 The CNS SG/24 meeting adopted following **8** Conclusions and **5** Decisions, with items related to Surveillance and SURICG highlighted in blue:

Reference		Subject
Conclusion CNS SG/24/3 *(ACSICG/7/2 (ATFM/SG/10-3))*	-	Amendment of the AFTN/AMHS-based Interface Control Document (ICD) for ATFM
Conclusion CNS SG/24/4	-	Publishing of the CRV Operations Manual
Decision CNS SG/24/5	-	CRV Landing Page on the ICAO APAC Website
Decision CNS SG/24/*6* *(SRWG/4/1)*	-	Frequency requirements for VHF-COM systems and ILS, VOR, DME and GBAS/VDB facilities
Conclusion CNS SG/24/7 *(SRWG/4/2)*	-	Simulation of VHF COM Frequency requirements for next 10 years
Conclusion CNS SG/24/8 *(SRWG/4/3)*	-	Establishment a list of focal point responsible for the operation of Frequency Finder in States
Decision CNS SG/24/9 *(SRWG/4/4)*	-	Revision of the Term of Reference of the SRWG
Conclusion CNS SG/24/10	-	Flight Inspection Guidance Material (FIGM) for APAC Region
Conclusion CNS SG/24/11	-	Protection of ILS Critical and Sensitive Areas in Three Dimensional
Decision CNS SG/24/12 *(SURICG/5/2)*	-	Dissolution of SEA/BOB ADS-B WG
Conclusion CNS SG/24/14 *(SURICG/5/4(DAPs WG/3/2))*	-	Mode S DAPs IGD 2.0
Conclusion CNS SG/24/15 *(SURICG/5/6)*	-	Revised ADS-B Implementation and Operations Guidance Document (AIGD) Edition13
Decision CNS SG/24/16 *(SURICG/5/1)*	-	Establishment of Study Group under SURICG on Sharing of Surveillance Data in SWIM

2.3 The contents of above Conclusions adopted by the CNS SG/24 are provided in the **Attachment A** to this paper.

Outcomes of APANPIRG/31

2.4 Based on the outcome of discussions on various agenda items, the CNS SG/24 meeting developed 4 Draft Conclusions for consideration by APANPIRG/31 Meeting, which were further adopted by APANPIRG/31 with only editorial amendment. The conclusions adopted by APANPIRG/31 are as follows, with items related to Surveillance and SURICG highlighted in blue:

Reference		Subject
APAPPIRG C 31/12 *(Draft Conclusion CNS SG/24/1)*	-	Target Year of CRV Implementation in APAC Region
APANPIRG C 31/13 *(Draft Conclusion CNS SG/24/2 (ACSICG/7/1))*	-	Revised Regional Strategies on AMS and Datalink
APANPIRG C 31/14 *(Draft Conclusion CNS SG/24/13 (SURICG/5/3(DAPs WG/3/1)))*	-	Mode S Forward Fit Equipage in APAC Region
APANPIRG C 31/15 *(Draft Conclusion CNS SG/24/17)*	-	Addressing Human Factor Issues of ATSEP

2.5 All APANPIRG/31 Conclusions related to CNS are included in **Attachment B** to this paper.

Discussions in SURICG/5

2.6 SURICG/5 noted that the Proposal for Amendment (PfA) to the Regional Supplementary Procedure (SUPP Doc 7030) from SURICG/2 has been processed in accordance with established procedure and the approved PfAs were circulated to States on 18 June 2020 through a State Letter with reference: T8/11.2 – AP130/20 (CNS), and this change will be incorporated in the new Six Edition of Doc 7030/6 as part of the restructuring process of Doc 7030.

PNG Deployment of Space Based ADS-B

2.7 After a successful space-based ADS-B trial using a VPN on the internet to deliver data, PNG has contracted for space-based ADS-B to serve the whole PNG FIR plus 50 miles. Service acceptance testing will be performed by the ANSP, supported remotely by Aireon (due to COVID-19). It was expected to become operational later in 2020 and will operate in tandem with existing ADS-B and radar services.

2.8 The system will initially use dual MPLS lines to USA to receive the service, but PNG has joined CRV and expects to transition to a dual CRV solution in 2021. The CRV solution will use two Package C nodes, supported by 1 MPLS and one VSAT terminal. A CRV contract has been signed with PCCWG to provide the CRV connections supporting AFTN/AMHS, Voice, AIDC, ADS-B ground station sharing and space-based ADS-B. Aireon was approved to connect to the CRV earlier in 2020 and can now deliver space-based ADS-B to other CRV customers potentially without additional communication links. PNG also anticipates sharing ADS-B ground station data with Australia and Indonesia via CRV.

FAA's Operational Evaluation of Space-based ADS-B in the Caribbean

2.9 Review of the received SBA data has highlighted the following potential issues:

1) Lack of detection for single antenna installations (e.g., Bottom only)
2) Poor performance (e.g. low power) from diversity installations

3) Short periods of time with single satellite coverage.

2.10 The FAA, in collaboration with Aireon, have identified the following as potential mechanisms to improve airspace performance:

1) Identify poor performing aircraft for remediation;
2) Aireon to modify their system to optimize coverage and improve probability of detection (Pd); and
3) FAA implement an exclusion list for poor performing aircraft

2.11 The FAA will continue to analyse data to identify improvements made from coordinated work with Aireon and relevant stakeholders. This analysis and coordinated work will assist in identifying the potential impact that each issue is having on aircraft detection. If necessary, the FAA will also work with appropriate foreign counterparts to create an adequate Standard Operating Procedure (SOP) for handling aircraft with diversity antenna installations versus non-diversity installations.

Long-range Air Traffic Surveillance Display System for ATFM

2.12 Hong Kong China has developed an in-house system for displaying long-range air traffic surveillance tracks up to 4,000km from the Hong Kong International Airport, which is approximately 5 hours of flying time beyond airspace boundary. The system is designed to enhance the situational awareness of flow managers on the air traffic and assist in flow control decision making. It is currently used by ATFM Unit of Hong Kong China in assessing the overall impacts of certain flow restriction imposed by other airspaces.

2.13 The long-range air traffic surveillance display system is based on terrestrial ADS-B data service for monitoring air traffic from "departure to destination". Space-based ADS-B data is planned to be integrated into the system to strengthen the coverage by early 2021. The Human Machine Interface (HMI) of the display system has been specially designed for flow managers with an aim to reduce display clutter caused by various elements and enhance HMI efficiency.

Additional System Area Codes (SAC) for Surveillance Systems in APAC and Update on Regional Supplement to ASTERIX ICD

2.14 With the development and expansion of surveillance facilities, there is a need to introduce additional System Area Codes (SAC) for surveillance systems in APAC. Subsequently, the Regional Supplement will have to be updated to cater the new introduction.

2.15 The secretariat informed the meeting through the working paper that Australia had requested ICAO APAC Regional Office for an additional SAC for its surveillance facilities. According to the Recommendation in paragraph 3.1.2 of the ICD, ICAO APAC Regional office has accepted the $A4^{hex}$ to be the additional SAC as proposed by Australia.

2.16 The acceptable code $A4^{hex}$ is to be reflected into the next edition the Regional Supplement as in Table 1, and the System Identification Code (SIC) provided by Australia, Laos PDR and the Philippines, as well as the editorial updates on the binary representation of SAC of Brunei Darussalam are to be reflected into the next edition the Regional Supplement which is provided here:
https://www.icao.int/APAC/Meetings/2020%20CNS%20SG24/APX.%20L%20-%20ASTERIX%20RADAR%203rd%20edition%20-%20Clean%20copy.pdf.

The ICAO Aircraft Address Monitoring in Japan

2.17 As an agreed action item by SURICG/4, Japan presented to the meeting on its experience on the ICAO Aircraft Address (Mode-S address) monitoring since 2007, which including monitoring activity, tool function, monitoring results and reporting paths. JCAB already took 6 correcting actions

for Japanese civil aircraft and JSDF (Japan Self Defense Force) aircrafts in recent 4 years. The meeting thanked Japan for this sharing and agreed to incorporate the main content of this paper into the AIGD.

Introduction to the Management and Application of 24-Bit Aircraft Addresses for Chinese Civil Aviation

2.18 CAAC issued "Regulation for Aircraft Address Management of Civil Aircraft " to make use of aircraft addresses efficiently and standardly for civil aviation in China. The 24-bit address has a greater advantage to identify aircraft than the traditional SSR code. With the implementation of the National ADS-B Construction Project and the application of the Mode S radars, it becomes possible to identify aircraft by 24-bit aircraft address in ATM automation system.

Implementation of New Surveillance System within Pyongyang FIR

2.19 This paper presented the information on the transition of surveillance system from SSR to ADS-B within Pyongyang FIR. The relevant information of new surveillance system implementation was issued by NOTAM early in February of this year and published the relevant AIRAC AIP AMDT effective from October 08, 2020 through the AIS. RAIM prediction NOTAM is planned in future and ADS-B data sharing with adjacent States is also proposed.

Latest Update on ADS-B OUT Mandate in Europe

2.20 Hong Kong China informed the meeting about the deferral of European ADS-B mandate from 7 June 2020 to 7 December 2020. The announcement by European Commission (EC) on 5 May 2020 also included new amendments allowing certain non-ADS-B operations.

Standards to Support Global Interoperability

2.21 As invited by the meeting, Mr. Christian Schleifer Heingärtner, the Secretary General of EUROCAE presented to the meeting on the role, function, process and available resources of this worldwide recognised industry standards-development organisation for aviation. The presentation also covered the domains of activities with highlights on surveillance related updates.

2.22 The meeting expressed its appreciation and gratitude to EUROCAE, encouraged States to nominate members to attend various technical WG meetings. EUROCAE suggested to focus on challenges and priorities to effectively balance the needs in different regional environments in making standards. As it is globally and publically open, EUROCAE encouraged SURICG members to make use of the online resources by subscribing the email service from EUROCAE webpage at www.eurocae.net to enhance the engagement with EUROCAE, and benefit from this open consultation process in the standards development, to gain visibility and have the possibility to provide comments on draft standards. The meeting highly recognized the value to explore more on better collaboration with EUROCAE during various meetings in APAC region.

Report of SEA/BOB ADS-B WG/15 Meeting

2.23 The Chairperson of SEA/BOB ADS-B WG/15 from CAA Singapore presented the Report of the Fifteenth Meeting of the South-East Asia/Bay of Bengal Sub-Regional ADS-B Implementation Working Group (SEA/BOB ADS-B WG/15), held in Singapore from 3 to 5 December 2019. The meeting noted updates of ADS-B projects and activities in the South East Asia and Bay of Bengal sub-regions presented in the meeting report.

2.24 The meeting reviewed and further updated the ADS-B implementation information consolidated by SEA/BOB ADS-B WG/15 and SURICG/5, and the Table of ADS-B Implementation Status in the APAC Region is provided here:
https://www.icao.int/APAC/Meetings/2020%20CNS%20SG24/APX.%20M%20-%20ADS-B%20Implementation%20Status%20in%20the%20PAPC%20Region.pdf.

2.25 Currently 30 States/Administrations installed ADS-B ground stations, 12 States issued ADS-B mandate and 8 States used ADS-B for separation and others for awareness, gap filling and redundancy.

Achievement and future of SEA/BOB ADS-B WG

2.26 The meeting reviewed and discussed the paper jointly presented by Singapore, CANSO and the Secretariat. The meeting recalled that the SEA ADS-B WG was established by APANPIRG in 2007 through APANPIRG conclusion 18/38. In 2011, SEA ADS-B WG was renamed as SEA/BOB ADS WG.

2.27 The meeting discussed next step and the possible future work for the ADS-B WG including a number of new tasks identified in the proposed amendment to TOR. The meeting also discussed whether the SEA/BOB ADS-B WG should be closed and a new working group – regional ADS-B working group be established to deal with identified new subject/works. The meeting further considered an option to merge the work of the working group into work programme of SURICG. The meeting discussed benefits and cost of each option, but could not reach a consensus by all members of SEA/BOB ADS-B WG. As such a vote was proposed and conducted among members of SEA/BOB ADS-B WG. Finally, based on the outcomes of the vote, the meeting agreed to formulate a draft Decision on the dissolution of SEA/BOB ADS-B Working Group for CNS SG/24 consideration.

2.28 With aforementioned, the meeting adopted the following Decision:

<table>
<tr><td colspan="2">Decision CNS SG/24/12 (SURICG/5/2) - Dissolution of SEA/BOB ADS-B WG</td></tr>
<tr><td>What: Noting that most of the tasks outlined in the TOR have been achieved and the completion of residual part of action items will be performed by SURICG,

That, the SEA/BOB ADS-B WG be dissolved.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: The SEA/BOB ADS-B WG terms of reference have been completed and pending action items will be performed by SURICG.</td><td>Follow-up: ☐Required from States</td></tr>
<tr><td>When: 4-Dec-20</td><td>Status: Adopted by Sub-group</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐APANPIRG ☒Other: SURICG</td></tr>
</table>

2.29 The meeting highly recognized the great achievements made by SEA/BOB ADS-B WG in past years, SURICG was requested to carefully design future meeting structure in four days to maintain the effectiveness in promoting ADS-B and implementing data sharing.

ADS-B Data Sharing between China/Myanmar & China/Laos PDR.

2.30 China proposed to conduct the sharing of ADS-B data with Myanmar and Laos PDR in the phased approach.

Update on ADS-B Avionics Problem Reporting Database (APRD)

2.31 Hong Kong China updated the meeting on the latest status of ADS-B Avionic Problem Reporting Database (APRD) after its deployment in ICAO APAC web site in 2017. The APRD could contain useful information of generic ADS-B avionics performance problem commonly encountered in the Region as well as specific avionics issues that States/Administrations need to pay attention during the ADS-B Implementation. However, the usage of APRD by States/Administrations appears to be low since its deployment. States/Administrations were encouraged to make best use of the database to improve the quality of avionics equipage in ADS-B mandated airspace, report and share avionics issues.

APRD direct link: https://applications.icao.int/ADSB-APRD/login.aspx

Demonstration on space-based ADS-B data and DCPC SATVOICE trials

2.32 The meeting appreciated a brief demonstration presented by Singapore on the ADS-B data derived from space-based ADS-B and the audio recording of HF, VHF and DCPC type of SATVOICE conversations between ATC controllers and pilots for voice quality comparison. An in-house developed processing server can filter the ADS-B data for the specified airspace for display or for onwards transmission to another user.

Utilization of Mode-S DAPs Data for Weather Forecast

2.33 As advanced ATM, like Trajectory Based Operation (TBO), requires high-accurate trajectory prediction. One of major factors of estimated flight time error in TBO is weather uncertainty. DAPs data are expected to be useful for improving numerical weather prediction because temporal and spatial intervals of DAPs data are very short. Japan conducted experiments for improving weather forecast accuracy by utilizing DAPs data extracted from BDS 5,0 and BDS 6,0, and the experimental results indicated that Mode S DAPs data have a potential to improve weather forecasts.

Guidance Material for Assignment of Interrogator Codes (IC) for MLAT and ADS-B

2.34 In the previous Mode S DAPs WG meetings, there were discussions on which II codes should be used by MLAT and ADS-B with interrogators. In practice, interrogators for MLAT are assigned II code = 0. While its logical for II code = 0 to be used for such equipment, some of the content in the Annex 10 Vol 4 and Doc 9924 seemed to either contradict or do not give clear indication. While the ICAO provisions do provide some guidance on the use of II Codes = 0, it does not provide the reader with clear guidance whether interrogators installed with MLAT and ADS-B may use II Code = 0.

2.35 The ICAO Surveillance Panel (SP) Aeronautical Surveillance Working Group (ASWG) has been informed in Sep 2019 on the lack of guidance material relating to this issue. During the ASWG meeting, it was generally agreed that II=0 may be used for interrogators in both MLAT and ADS-B. It is expected that new text will be adopted by ASWG sometime this year.

Mode S Roadmap

2.36 Mode S DAPS WG/3 discussed the recommended roadmap for various Mode S DAPs related issues to be adopted by SURICG. The SURICG/5 meeting noted the effectiveness and achievements made by DAPs WG in last year, and recognized that the complex situation in publishing the regional roadmap on evolving Mode S technology, Mode S DAPs WG was then tasked to conduct more studies and further polish the roadmap, aiming to formulate a new version for consideration by SURICG/6 meeting in 2021.

Mode S Mandates

2.37 Considering that a number of applications will require Mode S DAPs, and that it would be easier for new aircraft to be fitted with Mode S upon delivery rather than to retrofit at a later date. It is also noted that Enhanced Surveillance (EHS) can support more applications than Elementary Surveillance (ELS), States are strongly encouraged to mandate forward fit of Mode S of EHS by 1 Jan 2022. IATA expressed support to Mode S in general as well as forward-fit of EHS. As for retrofitting existing airframes equipped with Mode A/C with Mode S transponders, the proposed timeframe for 1 Jan 2022 was tight for airlines that had portions of their fleet with Mode A/C only. It was a challenging target date to meet in normal circumstances and with the impact of the COVID crisis on airline economics, it could become even more challenging. As such, the meeting agreed to defer retrofit of Mode S transponder to DAPs WG for further deliberation. IATA would also be invited to take part in discussion on Mode S roadmap/mandate in the coming meetings of DAPs WG.

2.38 Therefore, a Draft Conclusion was adopted by APANPIRG/31 as follows:

<table>
<tr><td colspan="2">Conclusion APANPIRG/31/14 (CNS SG/24/13 (SURICG/5/3(DAPS WG3/1))) - Mode S Forward Fit Equipage in APAC Region</td></tr>
<tr><td>What: Regarding fitment of Mode S 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 1 January 2022 be equipped with Mode S avionics compliant with Enhanced Surveillance (EHS).</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: 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.</td><td>Follow-up: ☒Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td>Status: Adopted by PIRG</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☒APANPIRG ☐ICAO HQ ☒Other: SURICG</td></tr>
</table>

2.39 In response to APANPIRG/31 conclusion APANPIRG/31/14, a state letter Reference No-T 8/5.11 AP003/21 (CNS) dated 6 January 2021, subject- *Mode S Forward Fit Equipage in APAC Region* was sent to States.

SSR Reception Malfunction Caused by UAV Video Transmitter

2.40 The UAV video transmitter device is using 1,080MHz to 1,200MHz, which overlapped the frequencies of SSR and DME, and may have a significant impact on SSR and DME.

Amendments to the Guidance Materials

2.41 The edition 1.0 of the Mode S DAPs IGD has been adopted in 2019 to provide guidance for States in the implementation and operational application. The Mode S DAPs WG made further improvements to the Mode S DAPs IGD. The main changes include adding introduction of Mode S DAPs data source, additional text for Mode S mandates, supplement benefits to ATC operation brought by Mode S DAPs, revise procedure of DAPs extraction, refine the regulations and procedures related to the use of ICAO 24-bit Aircraft Address/Aircraft Identification and add one specific example of Mode S DAPs application. Accordingly, the meeting CNS SG/24 adopted the Conclusion:

<table>
<tr><td colspan="2">Conclusion CNS SG/24/14 (SURICG/5/4(DAPS WG3/2)) - Mode S DAPs IGD 2.0</td></tr>
<tr><td>What: That, the Mode S DAPs Implementation and Operation Guidance Document Edition 2.0 provided in Appendix N 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>Follow-up: ☐Required from States</td></tr>
<tr><td>When: 4-Dec-20</td><td>Status: Adopted by Sub-group</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

Revised TOR of Mode S DAPs WG

2.42 The Mode S DAPs WG/3 reviewed the Terms of Reference that was adopted by SURICG/4 through **Decision SURICG 4/4**. The meeting proposed minor editorial changes to the TOR, and included Australia, Indonesia, Nepal and Sri Lanka as new members. USA will continue to join the DAPs WG activities as observer.

2.43 In response to CNS SG/24 conclusion CNS SG/24/14, a state letter Reference No- T 8/9.1 – AP262/20 (CNS) dated 22 December 2020, subject- *The availability of various regional guidance materials for implementation of Air Navigation Facilities and Services in the Asia and Pacific Regions* was sent to States.

Allocation of 24-Bit Aircraft Addresses

2.44 The Meeting was briefed on possible changes to the allocation of 24-bit aircraft addresses. Blocks of 24-bit aircraft addresses are assigned to States by ICAO. Each block is defined by a fixed pattern of the first 4, 6, 9, 12 or 14 bits of the 24-bit address. Thus, blocks of different sizes (1,048,576, 262,144, 32,768, 4,096 and 1,024 consecutive addresses) are made available. In the last decade, some States with 1,024 addresses have developed their air hub and does not have enough addresses. The SP-ASWG has tasked its Technical Sub-group (TSG) to investigate/identify options for additional allocation of 24-bit aircraft addresses to States who currently have a small number of addresses (such as 1024).

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

2.45 Proposed changes to AIGD are summarized as below:

- Updated the status of known ADS-B avionics problems in Attachment A of Appendix 2 "List of known ADS-B avionics problems", including:
  - B787 NACv = 0 Issue
- Updated Section 5.1.4.5.1 on ICAO Aircraft Address Monitoring
- Added the following new sections:
  - Use of ADS-B for Airport Surface Movement (Section 9.3.6)
  - 1090 MHz Spectrum and 24-bit Aircraft Address Issue with Unmanned Aircraft Systems (UAS) (Section 9.3.7)
  - Measures for Enhancing the Security of ADS-B (Section 10.3)
  - Time Difference of Arrival (TDOA) Based Position Verification Method (Section 10.3.1)

2.46 The meeting agreed to adopt the following Conclusion:

<table>
<tr><td colspan="4">Conclusion CNS SG/24/15 (SURICG/5/6) - Revised ADS-B Implementation and Operations Guidance Document (AIGD)</td></tr>
<tr><td colspan="3">What: That, the revised ADS-B Implementation and Operations Guidance Document (AIGD) provided in Appendix O to the Report, which consolidated all change proposals during SURICG/5, be adopted as Version 13.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why:</td><td>Updates and editorial correction</td><td>Follow-up:</td><td>☐Required from States</td></tr>
<tr><td>When:</td><td>4 Dec 2020</td><td>Status:</td><td>Adopted by Sub-group</td></tr>
<tr><td>Who:</td><td colspan="3">☒CNS Sub group ☐APAC States ☒ICAO APAC RO ☐ICAO HQ</td></tr>
</table>

2.47 In response to CNS SG/24 conclusion CNS SG/24/15, a state letter Reference No- T 8/9.1 – AP262/20 (CNS) dated 22 December 2020, subject- *The availability of various regional guidance materials for implementation of Air Navigation Facilities and Services in the Asia and Pacific Regions* sent to states.

Collaboration in Sharing of Surveillance Data in SWIM

2.48 Hong Kong China and Singapore presented some key considerations leading to a proposal of a Commercial-ANSP collaboration scheme in sharing and enriching surveillance coverage for the region to benefit the aviation community and accelerate the implementation of SWIM.

2.49 It is suggested to establish a Study Group under SURICG and supported by subject matter experts in SWIM, CRV and ATFM etc. and under the guidance of ICAO APAC to advise CNS SG on the best approach for regional surveillance data sharing. This proposal was also presented to SWIM TF/4 as WP/13 and resulted into an action item 4-4. The meeting was invited to consider the Commercial-ANSP collaboration scheme and the various consideration factors leading to this potential scheme. It is requested to consider the potential developments in surveillance data, particularly ADS-B data as SWIM services carried over CRV and support the establishment of the Study Group to recommend solutions on regional surveillance data sharing to provide surveillance from "departure to destination".

2.50 The meeting noted the Draft Decision SURICG/5/1 as well as the relevant outcome from SWIM TF/4, and an ad hoc group led by Hong Kong China had prepared a draft TOR for the proposed Study Group for further consideration by CNS SG. After deliberation, the meeting discussed the draft TOR through **Flimsy/06**, and deferred to the Study Group to fine-tune its TOR and decided its time schedule and deliverables for updating to SURICG. It was agreed that SURICG will be held after SWIM TF, so that the progress made by the Study Group would be shared with SWIM TF before reporting to SURICG. The meeting adopted the following Decision:

<table>
<tr><td colspan="3">Decision CNS SG/24/16 (SURICG/5/1) - Establishment of Study Group under SURICG on Sharing of Surveillance Data in SWIM</td></tr>
<tr><td colspan="2">What: Noting the operational needs of this region to enhance surveillance data sharing and new technologies available,

That, the Study Group under SURICG on Sharing of Surveillance Data in SWIM (SurSG) with TOR provided in Appendix P to the Report, comprising subject matter experts in relevant areas including surveillance and SWIM to be set up to study and recommend solutions on surveillance data sharing to provide surveillance from "departure to destination", be established.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To enhance surveillance coverage, enhance surveillance data availability by providing additional layers of surveillance services, and support implementation of advanced Air Traffic Management (ATM) tools such as Air Traffic Flow Management (ATFM).</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 4-Dec-20</td><td colspan="2">Status: 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>

2.51 In response to CNS SG/24/16 decision, a study group was formed. First meeting of Surveillance study group SURSG/01 is scheduled *from 20-22 April 2021 via Video Tele-Conferencing*.

Air Traffic Control Surveillance Activities in India

2.52 India is continuously upgrading and augmenting the current surveillance capabilities. Indian airspace is covered by redundant surveillance coverage including 16 nos. of ASR/MSSR, 02 nos. of ARSR/MSSR, 12 independent MSSR, 04 ADS-C/CPDLC links, 21 ADS-B Ground receivers, and 11 Nos. of ASMGCS.

2.53 India has entered a service contract with service provider of space-based ADS-B for Chennai and Mumbai. India has entered into agreement or planning to share ADS-B data with neighboring countries such as Myanmar, Malaysia, and Indonesia. 36 Nos of ADS B ground receivers have been planned. These will enhance redundancy for surveillance in existing Radar airspace and extend surveillance coverage to low density airports and certain oceanic airspace including facilitate extension of surveillance coverage for low altitude. ADS-B based surveillance approach centers have been established for 7 Non-Radar airports i.e. Calicut, Tiruchirappalli, Patna, Agartala, Bhubaneshwar, Coimbatore, and Jaipur. ADS-B based Surveillance services has been established for 'Terminal and En-route' operations at 4 airports i.e. Ahmedabad, Cochin, Guwahati, and Trivandrum. Work is in progress for 5 more such airports i.e. at Amritsar, Mangalore, Lucknow, Varanasi, and Mumbai. ADS-B Based Surveillance for En-route operations have been done at Dibrugarh, Jaisalmer, Nagpur, Port Blair, and Vijayawada.

2.54 The DGCA of India has issued ADS-B Avionic mandate from 01.01.2020 onwards. All aircrafts flying over Indian continental airspace at or above FL-290, are to be equipped with on-board ADS-B equipment. Also, contemplating to provide priority in landing to the aircrafts equipped with ADS-B at airports where ADS-B based approach surveillance services are being provided is going on.

Japan's Effort to A-SMGCS: Data-Driven and Simulation-Based Research Activities on Airport Surface Traffic Flow

2.55 Growth in traffic volume in busy airports induces surface traffic congestion, which degrade operational efficiency and results in uncertain taxiing times. It is necessary that efficiency measures should be devised. In Japan, ENRI (Electronic Navigation Research Institute) is supporting the administrative activities on airport surface management by problem identification, development of airport surface traffic simulator (GRACE), and simulation studies on efficiency improvement. ENRI use Aircraft position data at every second by SMR, MLAT etc., parking gate assignment records, and ATC process records and input them to GRACE to compare the actual and simulated traffic situations precisely.

Lockout Override Operation to Avoid IC(II) Code Collision

2.56 Republic of Korea (ROK) presented information about the Mode-S radar configuration to avoid IC code collision with adjacent radars and the performance evaluation result. For countermeasure to avoid Mode-S IC collision, ROK proposed two ways. First is to change MIP (Mode interlace pattern) to add classic Mode-A, Mode-C and second is the use of lockout override with probability of ½. Pros and cons of both methods were described. It is informed that Incheon airport is testing "Lockout Override with PR 1/2". Current test result show that still there is no reason not to use Lockout override in the IC collision condition. No side-effect of lockout override configuration is observed. As the result, lockout override of probability 1/2 could be a good solution for the radar having the problem to acquire the new aircraft address in the Mode-S IC code collision region.

Status Summary of Conclusions/Decisions in SURICG/5

2.57 The status of Conclusions/Decisions from SURICG/5 is summarized below for easy reference.

Conclusions/ Decisions in SURICG/5	**Endorsed as**	**Title**	**Status**
SURICG/5/1	Decision CNS SG /24/16	Establishment of Study Group under SURICG on Sharing of Surveillance Data in SWIM	The first Surveillance Study Group Meeting (SURSG/1) was held on 20-22 April 2021
SURICG/5/2	Decision CNS SG /24/12	Dissolution of SEA/BOB ADS-B WG	Dissolved and identified tasks were discussed in SURICG/6
SURICG/5/3 (DAPS WG3/1)	Conclusion APANPIRG/31/14 (CNS SG/24/13)	Mode S Forward Fit Equipage in APAC Region	Endorsed
SURICG/5/4 (DAPS WG3/2)	Conclusion CNS SG /24/14	Mode S DAPs IGD 2.0	Endorsed
SURICG/5/5 (DAPS WG3/3)	-	Revised ToR of Mode S DAPs WG	Endorsed
SURICG/5/6	Conclusion CNS SG /24/15	Revised ADS-B Implementation and Operations Guidance Document (AIGD)	Endorsed

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review the outcome of the CNS SG/24 and APANPIRG/31 and take any necessary follow-up actions; and

b) discuss any matters as appropriate.

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List of Conclusion/Decisions adopted by CNS SG/24 on behalf of APANPIRG on Technical Matters

Conclusion CNS SG/24/3(ACSICG/7-2 (ATFM/SG/10-3)) - Amendment of the AFTN/AMHS-based Interface Control Document (ICD) for ATFM	
What: That, the AFTN/AMHS-based Interface Control Document for ATFM Version 2.0 provided in **Appendix E** to this Report be adopted and posted on the ICAO Asia/Pacific Regional Office website to supersede the existing version, for use by Asia/Pacific Administrations in implementing cross-border ATFM communications in accordance with the provisions of the Regional Framework for collaborative ATFM.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To align with message format provisions of Annex 10 Vol II, and to support implementation by States through amendment to specific provisions.	Follow-up: ☒Required from States
When: 4-Dec-20	Status: Adopted by Subgroup
Who: ☒Sub groups ☒ APAC States ☐ICAO APAC RO ☐ICAO HQ ☒ other: ACSICG/7	

Conclusion CNS SG/24/4 - Publishing of the CRV Operations Manual	
What: That the CRV Operations Manual provided in **Appendix F** to this Report be adopted as first Edition for publishing and use.	Expected impact: ☐Political / Global ☐Inter-regional ☐Economic ☐Environmental ☒ Ops/Technical
Why: Provides the information and directions required for CRV OG performance and CRV operations.	Follow-up: ☒Required from States
When: 4-Dec-20	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Decision CNS SG/24/5 - CRV landing page on the ICAO APAC website	
What: That ICAO APAC Office is requested to create CRV landing page on ICAO APAC web page to providing information on CRV and guidance on how to join, leave or make changes.	Expected impact: ☐Political / Global ☒ Inter-regional ☐Economic ☐Environmental ☒ Ops/Technical
Why: Provides online access to the information and directions required for the Request Fulfilment Process and procedures to join, leave or make changes the CRV network	Follow-up: ☐Required from States

When: 4-Dec-20	Status: Adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Decision CNS SG/24/6(SRWG/4/1) - Frequency requirements for VHF-COM systems and ILS, VOR, DME and GBAS/VDB facilities	
What: That, the SRWG is tasked to develop a rolling frequency assignment plan for VHF-COM and ILS, VOR, DME and GBAS/VDB facilities to meet the operational requirements until [2030], subject to a regular review and updating by the SRWG.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To secure adequate spectrum for these facilities for the near future.	Follow-up: ☒Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion CNS SG/24/7(SRWG/4/2) – Simulation of VHF COM Frequency requirements for next 10 years	
What: To conduct a new round of simulation for VHF COM frequency assignment based on new operational requirements of States to 2030 as necessary.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To support regional strategy on the use of 8.33KHz channel spacing.	Follow-up: ☒Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion CNS SG/24/8(SRWG/4/3) – Establishment a list of focal point responsible for the operation of Frequency Finder in States	
What: That, States in APAC Region are requested to nominate a focal point responsible for operation of the Frequency Finder and coordination for frequencies assignments with ICAO APAC Regional Office in order to reduce operational error and improve quality management for the coordination process.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To reduce operational error in accessing the tool of Frequency Finder and improve the spectrum management quality by enhancing the administrative process.	Follow-up: ☒Required from States

When: 4-Dec-20	Status: Adopted by Sub-group

Decision CNS SG/24/9 (SRWG/4/4) – Revision of the Term of Reference of the SRWG	
What: That, the revised Terms of Reference provided in **Appendix J** to the Report be adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Need to refine the scope of related tasks and include the new members.	Follow-up: ☒Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Note: This revision is to conduct simulation on VHF COM frequency assignment and expand its scope of work to cover Navigation systems with highlight on GBAS implementation.

Conclusion CNS SG/24/10 – Flight Inspection Guidance Material (FIGM) for APAC Region	
What: That, the first edition of the Flight Inspection Guidance Material (FIGM) provided in **Appendix K** to this Report be adopted.	Expected impact: ☐Political / Global ☐Inter-regional ☐ Economic ☐Environmental ☒Ops/Technical
Why: To provide additional guidance on planning, execution and delivery of flight inspection for States/Administrations in APAC Region.	Follow-up: ☒Required from States
When: 4-Dec-20	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion CNS SG/24/11- Protection of ILS Critical and Sensitive Areas in Three Dimensional	
What: That, States to: a) take note of the importance in extending protection of ILS Critical and Sensitive Areas (CASA) from two dimensional to three dimensional as stated in ICAO Annex 10 (7th Edition, Amendment 92), Volume I, Attachment C, Paragraph 2.1.9.5; b) be aware that departing aircraft and/or manoeuvring helicopters/aircraft can cause disturbances to ILS signals	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒Ops/Technical

received by arriving aircraft under single runway mixed mode operation; c) take measures to mitigate potential impacts caused by disturbances in ILS signals under single runway mixed mode operation; and ICAO to: d) provide guidance materials in establishing three dimensional ILS CASA and their protection.	
Why: In accordance with ICAO Annex 10 (7th Edition, Amendment 92), Volume I, paragraph 2.1.9.5 – "While critical and sensitive areas are evaluated in a two-dimensional (horizontal) context, protection should actually be extended to volumes, as departing aircraft and/or manoeuvring helicopters/aircraft can also cause disturbances to the ILS signals". However, no detailed guidance was given as to how to establish the ILS CA/SA in three dimensional and how to protect them.	Follow-up: ☒Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: ☒ Sub groups ☒ APAC States ☐ICAO APAC RO ☒ICAO HQ ☐Other:	

Decision CNS SG/24/12 (SURICG/5/2) - Dissolution of SEA/BOB ADS-B WG	
What: Noting that most of the tasks outlined in the TOR have been achieved and the completion of residual part of action items will be performed by SURICG, That, the SEA/BOB ADS-B WG be dissolved.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐Economic ☐ Environmental ☒ Ops/Technical
Why: The SEA/BOB ADS-B WG terms of reference have been completed and pending action items will be performed by SURICG.	Follow-up: ☐Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐APANPIRG ☒Other: SURICG	

Conclusion CNS SG/24/14 (SURICG/5/4(DAPS WG3/2)) - Mode S DAPs IGD 2.0	
What: That, the *Mode S DAPs Implementation and Operation Guidance Document* Edition 2.0 provided in **Appendix N** to this Report be adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Editorial correction and revision to reflect regional updates in implementation.	Follow-up: ☐Required from States
When: 4-Dec-20	Status: Adopted by Sub-group

Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:

Conclusion CNS SG/24/15 (SURICG/5/6) - Revised ADS-B Implementation and Operations Guidance Document (AIGD)		
What: That, the revised ADS-B Implementation and Operations Guidance Document (AIGD) provided in **Appendix O** to this Report, which consolidated all change proposals during SURICG/5, be adopted as Version 13.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Updates and editorial correction	Follow-up: ☐Required from States	
When: 4 Dec 2020	Status: Adopted by Sub-group	
Who: ☒CNS Sub group ☐APAC States ☒ICAO APAC RO ☐ICAO HQ		

Decision CNS SG/24/16 (SURICG/5/1) - Establishment of Study Group under SURICG on Sharing of Surveillance Data in SWIM		
What: Noting the operational needs of this region to enhance surveillance data sharing and new technologies available, That, the Study Group under SURICG on Sharing of Surveillance Data in SWIM (SurSG) with TOR provided in **Appendix P** to the Report, comprising subject matter experts in relevant areas including surveillance and SWIM to be set up to study and recommend solutions on surveillance data sharing to provide surveillance from "departure to destination", be established.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To enhance surveillance coverage, enhance surveillance data availability by providing additional layers of surveillance services, and support implementation of advanced Air Traffic Management (ATM) tools such as Air Traffic Flow Management (ATFM).	Follow-up: ☒Required from States	
When: 4-Dec-20	Status: Adopted by Sub-group	
Who: ☒Sub Groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SURICG		

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A List of Conclusions from CNS SG/24 approved by APANPIRG/31 Meeting

APAPPIRG C 31/12 *(Conclusion CNS SG/24/1)*- **Target Year of CRV Implementation in APAC Region**	
What: That, set and monitor 2021 as the target for CRV implementation for all ANSPs.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒Ops/Technical
Why: Considering the challenges and difficulties faced by States/Administrations under current pandemic situation and recommended to postpone the target year of regional implementation of CRV from 2020 to end of 2021 and further align with follow up actions on Common Ground/Ground Telecommunication Network stated in the Beijing Declaration.	Follow-up: ☒Required from States
When: 16-Dec-20	Status: To be adopted by PIRG
Who: ☒ Sub groups ☒ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

APANPIRG C 31/13 (*Conclusion CNS SG/24/2(ACSICG/7/1))* - **the Revised Regional Strategies on AMS and Datalink**	
What: That, the revised Aeronautical Mobile Service (AMS) Strategy for the Asia/Pacific Region provided in **Appendix C** and the revised Strategy for Implementation of the Air-Ground Data Link in the Asia/Pac Region provided in **Appendix D** to the Report be adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒Ops/Technical
Why: Need to update the regional strategies on AMS and Datalink based on the latest developments	Follow-up: ☒Required from States
When: 16-Dec-20	Status: To be adopted by PIRG
Who: ☒ Sub groups ☒ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

APANPIRG C 31/14 (*Conclusion CNS SG/24/13 (SURICG/5/3(DAPS WG3/1*)) - **Mode S Forward Fit Equipage in APAC Region**	
What: Regarding fitment of Mode S 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 1 January 2022 be equipped with Mode S avionics compliant with Enhanced Surveillance (EHS).	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: Considering that a number of DAPs	Follow-up: ☒Required from States

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.	
When: 16-Dec-20	Status: To be adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☒APANPIRG ☐ICAO HQ ☒Other: SURICG	

APANPIRG C 31/15 (*Conclusion CNS SG/24/17)* **- Addressing Human Factor Issues of ATSEP**	
What: That, a) the States are encouraged to make reference and implement the recommendations made out of the IFATSEA study report *Factors adding stress and fatigue to ATSEP* provided in **Appendix R** to the Report for pro-active measures; b) States are also encouraged to join the small working group for finding the left-out gaps and in preparing the regional ATSEP human factor guidance material.	Expected impact: ☐Political / Global ☐Inter-regional ☒ Economic ☐Environmental ☒ Ops/Technical
Why: to continuously improve the human performance management in practice to better support CNS/ATM system operations.	Follow-up: ☒Required from States
When: 16-Dec-20	Status: Draft to be adopted by PIRG
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

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