



ICAO

International Civil Aviation Organization

First Meeting of the Surveillance Study Group (SURSG/1)

(Video Teleconference, 20– 22 April 2021)

Agenda Item 3: Review outcomes of relevant meetings

REVIEW OF RELEVANT MEETINGS/WEB-CONFERENCES

(Presented by the Secretariat)

SUMMARY

This paper presents the relevant outcomes of the Thirty First Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/31), actions on the works accomplished by Fourth Meeting of the APAC SWIM Task Force (SWIM TF/4) and Fifth Meeting of the Surveillance Implementation Coordination Group (SURICG/5).

1. INTRODUCTION

1.1 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>.

1.2 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 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>.

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1.4 The Fourth Meeting of the APAC SWIM Task Force (SWIM TF/4) was held from 3 to 6 November 2020 via video teleconference. The meeting was attended by 135 participants from 17 States/Administrations, 3 International Organizations namely IATA, IFALPA, IFATCA and 5 Industry partners namely, Atlas Air, Cirium, Frequentis, PCCW Global and Snowflake. SWIM TF/4 meeting report, working papers, information papers, and other resources can be accessed by following link:

<https://www.icao.int/APAC/Meetings/Pages/2020-SWIM-TF4.aspx>.

1.5 The APANPIRG/31 meeting reviewed the outcomes of the CNS SG/24, noted with appreciation the work done and achievements by the SG and the contributory bodies reporting to APANPIRG through the SG, the meeting discussed CNS related matters and took following actions on the report of CNS SG/24 meeting and other papers presented under Agenda Item 3.4.

1.6 This paper summarized relevant information and updates with the highlight on the reviewed outcomes of SWIM TF/4 and SURICG/5 meetings by CNS SG/24 and APANPIRG/31.

2. DISCUSSION

The actions taken by APANPIRG/31 meeting on surveillance related matters are highlighted below:

2.1 The CNS SG/24 meeting adopted following **8** Conclusions and **5** Decisions:

Reference	Subject
Conclusion CNS SG/24/3 (<i>ACSICG/7/2 (ATFM/SG/10-3)</i>)	- 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 (<i>SRWG/4/1</i>)	- Frequency requirements for VHF-COM systems and ILS, VOR, DME and GBAS/VDB facilities
Conclusion CNS SG/24/7 (<i>SRWG/4/2</i>)	- Simulation of VHF COM Frequency requirements for next 10 years
Conclusion CNS SG/24/8 (<i>SRWG/4/3</i>)	- Establishment a list of focal point responsible for the operation of Frequency Finder in States
Decision CNS SG/24/9 (<i>SRWG/4/4</i>)	- 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 (<i>SURICG/5/2</i>)	- Dissolution of SEA/BOB ADS-B WG
Conclusion CNS SG/24/14 (<i>SURICG/5/4(DAPs WG/3/2)</i>)	- Mode S DAPs IGD 2.0
Conclusion CNS SG/24/15 (<i>SURICG/5/6</i>)	- 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

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

2.3 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. The conclusions adopted by APANPIRG/31 are as follows:

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

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

Fourth Meeting of System Wide Information Management Task Force

Election of Co-Chair of the Task Force

2.5. Dr. Amornrat Jirattigalachote, Strategic Planning Manager (Engineering), Policy and Strategy Management Bureau of AEROTHAI, was elected as co-chair of the APAC SWIM Task Force.

Review SWIM Task Force Programme and outstanding action items

2.6. The meeting reviewed the development of SWIM TF’s work plan and the updating of Action List with highlight on the restructure of the task assignment and numbering. The meeting adopted the revised task structure through **Decision SWIM TF/4/1 - Revised SWIM TF Task Group**.

An Approach for APAC Regional SWIM Implementation

2.7. Japan presented the research and practical results of previous Task 1.8 and the optional approaches of regional SWIM construction and implementations within transition period. The research work of this Task was carried out in coordination with the tasks of ASEAN SWIM Demonstration and SWIM Service and Application Validation. To overcome the limitations of CRV and avoid the unsupportable point-to-point connections between all stakeholders, the cooperation between CRV and SWIM service providers is required. As result of discussion, the meeting agreed to adopt a *CRV-based interoperable architecture* in which the CRV communication and SWIM communication are divided into different layers to assure the performance of CRV for conventional AFTN/AMHS applications and improve the flexibility required for regional SWIM implementation. It is required SWIM service

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providers to establish common agreements and creating a collaborative environment at the regional level to ensure information exchange between different systems.

2.8. The meeting further discussed the technical capabilities of SWIM TI required to achieve interoperability during the transition period, such as: 1) The SWIM TI will have two interfaces that enable the exchange of information with both CRV-based legacy systems and SWIM-enabled systems; 2) SWIM-enabled systems need to receive/send different AFTN/AMHS message types (MET, AIS, and ATS) from/to CRV-based legacy systems according to information domain requirements; 3) The SWIM TI is able to decouple CRV-based legacy and SWIM-enabled applications from external systems that implement different communication protocols.

SWIM Technical Overview Centered around CRV

2.9. PCCWG, the CRV provider selected through ICAO TCB process, presented a system architecture of SWIM service. It is a managed SWIM solution which can be deployed with the preference of each member States and is proposed to run on CRV network as value-added service. PCCW SWIM infrastructure could be one of the global/commercial EMS nodes to deliver SWIM services or qualified third party services. The deployment options include on premise deployment, network based as well as hybrid model. This enables flexibility to meet individual State requirement.

Extension Development of FIXM to Support National ATFM Operations and ATFM/A-CDM Integration in China

2.10. In order to implement data sharing among ATFM stakeholders, and facilitate a seamless and agile exchange of ATFM data, the development of FIXM has been started by ATMB of CAAC in 2019, based on FIXM APAC FLOW Extension version 1.0. Additional data attributes required to be exchanged among stakeholders involving in ATFM operations and to support the integration between ATFM and A-CDM were identified in FIXM ATMB ATFM Extension version 0.1.

SWIM Discovery Service (SDS): Introduction

2.11. United States (USA) and Republic of Korea (ROK) introduced the concept of a SWIM Discovery Service (SDS). The ability to search for and locate (discover) services offered by a growing number of independently developed and autonomously managed SWIM domains is highly important and is a precursor for achieving global information exchange. The Federal Aviation Administration (FAA) and Korea Airports Corporation (KAC) are collaborating in an effort to define and test an approach for enabling federated service discovery across geographical and organizational boundaries. The paper described SDS interaction patterns and discussed the contents of the Implementation Specification, including SDS behavior model, information model, resource model, interface requirements, and security requirements. The meeting noted that the SDS approach is consistent with the federated registry architecture adopted at SWIM TF/3, and encouraged participants to collaborate on SDS development.

Security and Trust in the Context of SWIM Service Discovery

2.12. USA and ROK provided a discussion of Security and Trust in the Context of SWIM Service Discovery. The joint FAA and KAC effort to establish a SDS development and testing environment has identified the need to address issues of security and trust that might occur when multiple independently operated discovery services exchange information. The paper illustrated some of these issues using an example scenario (an end user wants to “find all operational flight services”) that requires intercommunication among three different discovery services. It went on to explain that FAA and KAC are investigating using a federated identity management solution approach to secure the communication and showed how this approach could answer questions raised in the scenario. The paper also provided an overview of the latest relevant security technologies, and it discussed the proposed APAC Mutual Trust Infrastructure being developed as part of the Security Management subtask (Task

5) and its relationship to issues of trust between discovery services. The meeting recommended that issues identified in the paper be addressed by the TF Governance task and TF Security Management task, and encouraged participants to collaborate further on this subject.

SWIM Service Category Taxonomy

2.13. USA presented a SWIM Service Category Taxonomy designed for the purpose of organizing SWIM services into classes or categories to make the services easier to find or manage. The paper defined taxonomies as hierarchical classification schemes and described this particular scheme as a 3-level hierarchy with a top level “SWIM Service” classified into two categories, “Information Service” (services that provide information products) and “Core Service” (services that provide support capabilities). Each category has subcategories; e.g., “Weather Service” is a subcategory of Information Service, and “Security Service” is a subcategory of Core Service. The virtue of this taxonomy is that it can be extended horizontally by adding more categories to any level of the hierarchy, or vertically by further dividing a particular category into more specialized subcategories; in this way it is able to meet future business needs. Rendering the taxonomy into machine language (see <https://semantics.aero/service-category>) also allows it to support applications for service discovery or governance processing. The paper concluded by suggesting that the taxonomy be adopted as a standard approach for classifying SWIM services.

Implementation Status of SWIM Discovery Service (SDS)

2.14. USA and ROK provided information on the Implementation Status of the joint FAA/KAC SDS effort. In October 2019, (FAA) SWIM and KAC began a collaborative effort to establish a virtual environment for conducting transparent and replicable development of discovery services for future deployment by APAC SWIM initiatives. The paper presented a list of FAA/KAC work items together with the current status of each item. Completed items include: a service registry for ROK SWIM, a SDS Specification v.1.0.0 (<https://discovery.swim.aero/sds/1.0.0/>), a Service Description Model for JSON (SDM-J) (<https://discovery.swim.aero/sdm-j/1.0.0/>), and several SDS operations implemented. Remaining items include carrying out bi-directional testing of SDS operations and formally reporting the result of the joint effort to SWIM APAC TF/4.

FF-ICE/R1 Service Validation and Implementation

2.15. This WP was presented via a joint demonstration led by Japan, China and Republic of Korea. To implement FF-ICE/R1 operation, not only SWIM Technical Infrastructure for sharing information between different systems but also information services for supporting operation between different ATM applications are required. The FF-ICE services are expected to be highly automated and are expected to be performed through computer-to-computer links within a SWIM environment. This demonstration validated the implementation of FF-ICE services and the process of related messages for FF-ICE/R1 operation through two scenarios by considering the FF-ICE/R1 capable ASPs and AUs (eASP and eAU). The demonstration shows that the SWIM-based FF-ICE operation is capable to provide related information in greater detail and allow the eAU and the eASP to share their expectations in an unambiguous manner via the exchange of trajectory information. Moreover, according to the scenario discussion and the test system development, some technical observations and recommendations are presented for improving regional SWIM and FF-ICE/R1 implementation.

SWIM in APAC Region: Where are we now and where are we going?

2.16. Japan recalled the main regional activities since the establishment of SWIM Task Force in 2017. Considering the important role and function of SWIM in Global Air Navigation Plan (Doc 9750) and the Global ATM Operation Concept (GATMOC), as well as the significant impact of COVID-19 on the aviation industry, it is essential to highlight more efficiency and a strengthened and shared strategy for implementing SWIM in the region with stakeholders.

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Regional Coordination

2.17. IATA presented to the meeting about the SWIM related activities (and their interdependencies) in planning or development within other Working Groups (WGs) and Task Forces (TFs) at regional level since SWIM TF/3, for a broader coordination of SWIM activities in APAC (not solely MET) and improved awareness of the work of the SWIM Task Force.

Breakout Session Summaries

2.18. During the planning period of SWIM TF/4, the chair, Task Leads and secretariat team conducted a number of online discussions, therefore agreed to set up a breakout session for SWIM TF/4 to facilitate the Task Leads and contributors to meet and update their assignment respectively with efficiency and effectiveness. Three online breakout meeting rooms were provided to accommodate tasks' discussion. The outcome of breakout session was reported by to the plenary by various Task Leads.

Update on APAC SWIM Implementation Materials

2.19. The outbreak of COVID-19 pandemic projected unprecedented impact on aviation industry and also changed the original plan and available resource of this task. Considering the significant change of task force programme after SWIM TF/3, and the progress of DOC 10039 Vol II, the meeting agreed to suspend ACTION ITEM SWIMTF/3/2 for some time and reactivate it upon further updates during the future Task Lead meetings or SWIM TF/5, and the meeting encouraged the participants and concerned parties to provide and share SWIM related video, training material and other useful information to SWIM TF and secretariat for future compilation.

Generation and Life Cycle Management of GUF I and Related Issues

2.20. China implemented the wide-area surveillance network function verification system which was fed with various data sources including AFS message system, satellite/ground-based ADS-B system, surveillance radar system, ACARS, etc. The system provides multi-category data services for airlines, airports, ATC units, administration, GADSS-related organizations and other data users. GUF I (Globally Unique Flight Identifier) is used in flight data management in the system, which is usually generated in the flight planning stage by the simulated ATM role and participate in the subsequent data exchange, and it is managed in the entire life cycle of a flight, so as to realize the persistent storage of FIXM format flight data in the system.

2.21. The paper briefed the GUF I's textual representation, encoding rules, and the accessing of various flight-related data, part of which is generated in real time, while others is generated after the flight. At each flight data access point, a GUF I management component is set up. Some identified issues to be addressed were also discussed in the paper, such as the method to exchange data between systems in different countries/regions, difficulty to uniformly generate GUF I on a global scale, and GUF I use to exchange flight data in the transition environment.

The Status of SWIM R&D in the Republic of Korea

2.22. The Republic of Korea has been conducting SWIM R&D following the ICAO Global Air Navigation Plan (GANP) and Korea's National ATM Reformation and Enhancement Plan (NARAE) since 2016. Korea Airports Corporation (KAC) is in charge of SWIM R&D and its purpose is to implement SWIM testbed and lay the foundation for the transition to a SWIM environment.

Report on SWIM in Australia

2.23. Australia summarised the activities and plans for the design and implementation of SWIM services in Australia. SWIM architecture and planning activities have been carried out by

Airservices Australia (ASA) and the Australian Bureau of the Meteorology (BOM) over the past 18 months. A number of proposals for the APAC SWIM community were formulated.

New IWXXM design to better support SWIM

2.24. Hong Kong China, being one of the members of the Task Team on Aviation Data (TT-AvData) of World Meteorological Organization (WMO), presented the latest update on the development of a new IWXXM design being studied by WMO TT-AvData for future versions of IWXXM. The new IWXXM design would introduce "Weather Object" to better facilitate retrieval and consolidation of individual meteorological element through SWIM information services.

The Status of Shared Information Quality Management in China

2.25. The paper presented the exploration and practice of Civil Aviation Administration of China (CAAC) for establishing information quality management system based on SWIM concept. As the number of participants and information shared for operation coordination are increasing rapidly, it is necessary to clarify the accountabilities, standardize the procedures and enhance the platform functions for information quality management.

SWIM in ASEAN Demonstration Report

2.26. Singapore and Thailand presented the SWIM in ASEAN Demonstration Report. SWIM in ASEAN Demonstration was successfully conducted on the 12 and 15 of November 2019, in Bangkok, Thailand and Singapore, respectively to demonstrate the principles of SWIM, show the potential operational benefits of SWIM and to demonstrate a model of SWIM implementation for ASEAN and Asia/Pacific Region. It got a wide participation of aviation stakeholders including CAAs, ANSPs, airport operators, airlines, and international organizations such as ICAO APAC, and IATA.

2.27. The Report covered details of the demonstration development, including operational scenario development, SWIM infrastructure, information services, and SWIM-enabled applications design, development, and test, and observations and lessons learnt. Various operational scenarios were conducted. Global Enterprise Messaging Services (GEMS) was selected as the architecture to support the demonstration. To ensure that messages would be routed correctly and in the most efficient manner possible, AMQP version 1.0 was chosen to be the standard protocol for the Demonstration. It was concluded that the existing standardized information exchange models, namely AIXM, FIXM, and IWXXM could be utilized for the exchange of aeronautical information, flight information, and weather information, respectively. The specific version of information exchange models, i.e. AIXM version 5.1, FIXM version 4.1, and IWXXM version 2.0, were selected. It was found that to address the specific needs, extensions to the core of the existing information exchange models are viable and effective solution. Additionally, mediation is a key to bring diverse stakeholders on board and to enable the early leveraging of seamless information sharing. Clearly defined operational use cases and processes are crucial to and prerequisite for SWIM development and implementation. SWIM ASEAN Demonstration Report was provided in Appendix I to CNS SG/24 meeting report.

2.28. The meeting congratulated Thailand and Singapore in leading this SWIM Demonstration, and highly recognized its contribution to the regional SWIM implementation. The meeting also encouraged SWIM TF to make better benefits from the cross cutting coordination with other contributory bodies of APANPIRG, in particular with CRV and ATFM, to further enhance the connection with infrastructure and the users.

5th Meeting of the Surveillance Implementation Coordination Group (SURICG/5)

2.29. 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

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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.

Collaboration in Sharing of Surveillance Data in SWIM

2.30 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.

2.31 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.

2.32 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”.

2.33 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:

Decision CNS SG/24/16 (SURICG/5/1) - Establishment of Study Group under SURICG on Sharing of Surveillance Data in SWIM	
<p>What: Noting the operational needs of this region to enhance surveillance data sharing and new technologies available,</p> <p>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.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>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).</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>
<p>When: 4-Dec-20</p>	<p>Status: Adopted by Sub-group</p>
<p>Who: <input checked="" type="checkbox"/> Sub Groups <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ</p> <p><input checked="" type="checkbox"/> Other: SURICG</p>	

2.34 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.

PNG Deployment of Space Based ADS-B

2.35 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.

2.36 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

2.37 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.

2.38 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

2.39 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

2.40 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.

2.41 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.

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

2.42 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.

2.43 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.

2.44 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

2.45 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

2.46 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

2.47 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

2.48 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

2.49 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.

2.50 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

2.51 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.

2.52 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%20APAC%20Region.pdf>.

2.53 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

2.54 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.

2.55 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.

2.56 With aforementioned, the meeting adopted the following Decision:

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	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional

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will be performed by SURICG,		<input type="checkbox"/> Economic
That, the SEA/BOB ADS-B WG be dissolved.		<input type="checkbox"/> Environmental
		<input checked="" type="checkbox"/> 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:	<input type="checkbox"/> Required from States
When: 4-Dec-20	Status: Adopted by Sub-group	
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> APANPIRG <input checked="" type="checkbox"/> Other: SURICG		

2.57 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.

2.58 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)

2.59 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

2.60 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

2.61 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

2.62 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.

2.63 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.

II/SI Operations

2.64 Although ICAO mandated that all aircraft transponders have to be SI capable for radars to use SI codes by 1 January 2003, but not all are SI capable.

2.65 Non SI capable transponders will only be able to recognize the last 4 bits, hence will mistakenly lock out to other radars with different SI codes, but with the same last 4 bits. To work around the situation, parts of Europe employed a special mode of operation known as the II/SI Operation. Under this operations, the radar will only lock-out aircraft with SI capable transponder but will not lock out non-SI capable transponder.

Mode S Roadmap

2.66 Mode S DAPS WG/3 discussed the recommended roadmap for various Mode S DAPs related issues to be adopted by SURICG.

Mode S Mandates

2.67 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.

2.68 Therefore, a Draft Conclusion is formulated for consideration of APANPIRG/31 and further adopted by APANPIRG/31 is:

Conclusion APANPIRG/31/14 (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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
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	Follow-up: <input checked="" type="checkbox"/> Required from States

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existing airframes with EHS will need further deliberation under challenging pandemic situation.	
When: 16-Dec-20	Status: Adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input checked="" type="checkbox"/> APANPIRG <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SURICG	

2.69 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* sent to states.

Use of SI Codes

2.70 Some Asia Pacific States/Administrations may require the use of SI code due to high concentration of Mode S radars. It is possible for certain regions in Asia Pacific to commence the use of SI codes first while the rest continue to uses the II code first. To overcome the issue with non SI-capable aircraft, the II/SI Code Operation may also be considered.

Radar Clustering

2.71 Very few States are practicing radar clustering. States with the competency and operational requirement may apply such technique.

Use of Conspicuity Code

2.72 Most Asia Pacific States still uses Mode A codes for flight plan coupling. In anticipation that Mode S codes would be used in future, it was agreed that the Mode A code of 1000 be reserved as the conspicuity code for Asia Pacific so as to match the European region. It is likely to take many years before all States can support this capability across APAC and EUR. The ATM systems must support the conspicuity code feature. In preparation on the use of the conspicuity code, States developing new automation systems are encouraged to include the conspicuity code capability into the system.

Weather Reporting Capability

2.73 Based on information provided by aircraft manufacturers, there is currently no service bulletins that will help upgrade aircraft with such weather reporting capability. There is also currently no plan to develop such upgrades. It is envisaged that weather reporting capability will be available in the next generation transponder. Instead of mandating weather reporting capability, it may be more practical to Mandate Enhanced Mode S and derive weather information using algorithms.

Datalink Map

2.74 Europe is experiencing very high usage of the 1090MHz frequency. In order to prevent States from over interrogating, Europe has a datalink map which restricts the registers that States can extract from. Europe even have rules stating that Mode S radars should not actively interrogate for Mode A and Flight ID unless there is a change. At this moment, the frequency congestion situation within Asia Pacific is not as severe as that in Europe. Hence it is not foreseen that such datalink map is required soon within APAC region.

2.75 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.

SSR Reception Malfunction Caused by UAV Video Transmitter

2.76 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

2.77 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.

2.78 Accordingly, the meeting CNS SG/24 adopted the following Conclusion drafted by SURICG/5:

Conclusion CNS SG/24/14 (SURICG/5/4(DAPS WG3/2)) - Mode S DAPs IGD 2.0	
What: That, the <i>Mode S DAPs Implementation and Operation Guidance Document</i> Edition 2.0 provided in Appendix N to this Report be adopted.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Editorial correction and revision to reflect regional updates in implementation.	Follow-up: <input type="checkbox"/> Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

2.79 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* sent to states.

Allocation of 24-Bit Aircraft Addresses

2.80 The Mode S DAPs WG 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.

2.81 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)

2.82 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

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- 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)

2.83 The meeting agreed to adopt the following Conclusion formulated by SURICG/5:

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:	<input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why:	Updates and editorial correction	Follow-up:	<input type="checkbox"/> Required from States
When:	4 Dec 2020	Status:	Adopted by Sub-group
Who:	<input checked="" type="checkbox"/> CNS Sub group <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ		

2.84 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.

SSR Reception Malfunction Caused by UAV Video Transmitter

2.85 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.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review the outcome of the APANPIRG/31 and take any necessary follow-up actions; and
- b) discuss any matters as appropriate.

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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> 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: <input checked="" type="checkbox"/> Required from States
When: 4-Dec-20	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Provides the information and directions required for CRV OG performance and CRV operations.	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 4-Dec-20	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> 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: <input type="checkbox"/> Required from States

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

When: 4-Dec-20	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To secure adequate spectrum for these facilities for the near future.	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To support regional strategy on the use of 8.33KHz channel spacing.	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> 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: <input checked="" type="checkbox"/> Required from States

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

When: 4-Dec-20	Status: Adopted by Sub-group
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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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Need to refine the scope of related tasks and include the new members.	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To provide additional guidance on planning, execution and delivery of flight inspection for States/Administrations in APAC Region.	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 4-Dec-20	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
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List of Conclusions/Decisions adopted by CNS SG/24 on behalf of APANPIRG on Technical Matters

<p>received by arriving aircraft under single runway mixed mode operation;</p> <p>c) take measures to mitigate potential impacts caused by disturbances in ILS signals under single runway mixed mode operation;</p> <p>and ICAO to:</p> <p>d) provide guidance materials in establishing three dimensional ILS CASA and their protection.</p>	
<p>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.</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>
<p>When: 4-Dec-20</p>	<p>Status: Adopted by Sub-group</p>
<p>Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input checked="" type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:</p>	

<p>Decision CNS SG/24/12 (SURICG/5/2) - Dissolution of SEA/BOB ADS-B WG</p>	
<p>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,</p> <p>That, the SEA/BOB ADS-B WG be dissolved.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: The SEA/BOB ADS-B WG terms of reference have been completed and pending action items will be performed by SURICG.</p>	<p>Follow-up: <input type="checkbox"/> Required from States</p>
<p>When: 4-Dec-20</p>	<p>Status: Adopted by Sub-group</p>
<p>Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> APANPIRG <input checked="" type="checkbox"/> Other: SURICG</p>	

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

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

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)	
<p>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.</p>	<p>Expected impact:</p> <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
<p>Why: Updates and editorial correction</p>	<p>Follow-up: <input type="checkbox"/>Required from States</p>
<p>When: 4 Dec 2020</p>	<p>Status: Adopted by Sub-group</p>
<p>Who: <input checked="" type="checkbox"/>CNS Sub group <input type="checkbox"/>APAC States <input checked="" type="checkbox"/>ICAO APAC RO <input type="checkbox"/>ICAO HQ</p>	

Decision CNS SG/24/16 (SURICG/5/1) - Establishment of Study Group under SURICG on Sharing of Surveillance Data in SWIM	
<p>What: Noting the operational needs of this region to enhance surveillance data sharing and new technologies available,</p> <p>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.</p>	<p>Expected impact:</p> <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
<p>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).</p>	<p>Follow-up: <input checked="" type="checkbox"/>Required from States</p>
<p>When: 4-Dec-20</p>	<p>Status: Adopted by Sub-group</p>
<p>Who: <input checked="" type="checkbox"/>Sub Groups <input checked="" type="checkbox"/>APAC States <input type="checkbox"/>ICAO APAC RO <input type="checkbox"/>ICAO HQ <input checked="" type="checkbox"/>Other: SURICG</p>	

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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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> 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: <input checked="" type="checkbox"/> Required from States
When: 16-Dec-20	Status: To be adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Need to update the regional strategies on AMS and Datalink based on the latest developments	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 16-Dec-20	Status: To be adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> 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: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Considering that a number of DAPs	Follow-up: <input checked="" type="checkbox"/> Required from States

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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: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input checked="" type="checkbox"/> APANPIRG <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SURICG	

APANPIRG C 31/15 (Conclusion CNS SG/24/17) - Addressing Human Factor Issues of ATSEP

<p>What: That,</p> <p>a) the States are encouraged to make reference and implement the recommendations made out of the IFATSEA study report <i>Factors adding stress and fatigue to ATSEP</i> provided in Appendix R to the Report for pro-active measures;</p> <p>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.</p>	<p>Expected impact:</p> <p><input type="checkbox"/>Political / Global</p> <p><input type="checkbox"/>Inter-regional</p> <p><input checked="" type="checkbox"/>Economic</p> <p><input type="checkbox"/>Environmental</p> <p><input checked="" type="checkbox"/>Ops/Technical</p>
<p>Why: to continuously improve the human performance management in practice to better support CNS/ATM system operations.</p>	<p>Follow-up: <input checked="" type="checkbox"/>Required from States</p>
When: 16-Dec-20	Status: Draft to be adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	
