International Civil Aviation Organization

Second Meeting of the Surveillance Study Group (SURSG/2)

(Video Teleconference (VTC), 15– 17 March 2022)

Agenda Item 2: Review of outcome of relevant meetings

REVIEW OF RELEVANT MEETINGS

(Presented by the Secretariat)

SUMMARY

This paper presents the relevant outcomes of the Thirty Second Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/32), actions on the works accomplished by the First Meeting of the Surveillance Study Group (SURSG/1), the Fifth Meeting of the APAC SWIM Task Force (SWIM TF/5) and the Sixth Meeting of the Surveillance Implementation Coordination Group (SURICG/6).

1. INTRODUCTION

1.1 The Thirty-second Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (**APANPIRG/32**) was held from *1 to 3 December 2021* via VTC. The Meeting was attended by 277 participants from 28 Member States, 2 Special Administrative Regions of China, and 8 International Organizations (AAPA, ACI, CANSO, IATA, ICAO, IFALPA, IFATCA, and PASO). APANPIRG/32 meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2021-APANPIRG32.aspx.

1.2 The Twenty Fifth Meeting of the Communications, Navigation and Surveillance Sub-group (**CNS SG/25**) of APANPIRG was held from *18 to 22 October 2021* via video teleconference. The meeting was attended by 215 participants from 23 States/Administrations, and 4 International Organizations namely CANSO, IATA, IFALPA, and IFATSEA, plus 28 participants from industry partners. CNS SG/25 meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2021-CNS-SG-25.aspx.

1.3 The Fifth Meeting of the APAC SWIM Task Force (**SWIM TF/5**) was held from *9 – 11 August 2021* via video teleconference. The meeting was attended by 173 participants from 21 States/Administrations, 4 International Organizations, and 1 service provider. SWIM TF/5 meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2021-SWIM-TF-5.aspx.

1.4 The Sixth Meeting of the Surveillance Implementation Coordination Group (**SURICG/6**) of CNS SG was held from *24 to 27 August 2021* via video teleconference. The meeting was attended by 116 participants from Nineteen (19) States/Administrations, Four (4) International Organizations, One (1) Aircraft Manufacturer, One (1) Service Provider from Industry, and Three (3) International Organizations. SURICG/6 meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2021-SURICG-6.aspx.

1.5 The First Meeting of the Surveillance Study Group (**SURSG/1**) was held from 20 to 22 April 2021 via video teleconference. The Meeting was attended by 118 participants from 15 States/Administrations, 4 International Organizations, and 2 industry partners (CANSO, IATA, ICCAIA, IFATCA, Frequentis, and PCCW Global). The meeting report, working papers, information papers, and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2021-SURSG-1.aspx**.**

1.6 The APANPIRG/32 meeting reviewed the outcomes of the CNS SG/25, 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 the following actions on the report of CNS SG/25 meeting and other papers presented under Agenda Item 3.4.

1.7 This paper summarized relevant information and updates from CNS SG/25 and APANPIRG/32 with the highlight on the reviewed outcomes of SURSG/1, SWIM TF/5, and SURICG/6 meetings, and relevant discussions of other meetings of CNS SG/25.

2. DISCUSSION

The actions taken by APANPIRG/32 meeting on surveillance related matters are highlighted below:

2.1 The CNS SG/25 meeting adopted the following **8** Conclusions and **5** Decisions:

Reference		Subject
Conclusion CNS SG/25/01 (*ACSICG/08/01(CRV/08/01)*)	-	CRV Implementation Plan amendment *(Version 2.1)*
Conclusion CNS SG/25/03 (*SWIM TF/05/01)*	-	Asia/Pacific SWIM Implementation Plan and Status Survey
Decision CNS SG/25/04 (*SWIM TF/05/02)*	-	Revised SWIM TF Terms of Reference
Conclusion CNS SG/25/05	-	The Catalogue of Asia and Pacific Flight Inspection and Flight Validation Service Providers
Conclusion CNS/SG/25/06	-	Update of Flight Inspection Guidance Material (FIGM) for APAC Region
Conclusion CNS SG/25/10 *(SURICG/6/4)*	-	Mode S DAPs IGD 3.0
Conclusion CNS SG/25/11	-	Revision of the Regional Supplement to ASTERIX

(SURICG/6/5)		Interface Control Document (ICD)
Decision CNS SG/25/12 *(SURICG/6/6)*	-	Revised ToR of Surveillance Study Group (SURSG)
Conclusion CNS SG/25/13 *(SURICG/6/7)*	-	Integrity of ICAO Aircraft Address and Target Identification in ADS-B / MLAT / Mode S Data and Flight Plan
Decision CNS SG/25/14 *(SURICG/6/8)*	-	Revised ToR of Surveillance Implementation Coordination Group (SURICG)
Conclusion CNS SG/25/15 *(SURICG/6/9)*	-	Revised ADS-B Implementation and Operations Guidance Document (AIGD)
Decision CNS SG/25/16 *(ATMAS TF/2/1 (APA TF/7/1))*	-	Dissolution of APA TF
Decision CNS SG/25/17 *(ATMAS TF/2/2)*	-	Revised ATMAS TF Terms of Reference

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

2.3 Based on the outcome of discussions on various agenda items, the CNS SG/25 meeting developed **4** Draft Conclusions for consideration by APANPIRG/32 Meeting, which were further adopted by APANPIRG/32. The Conclusions adopted by APANPIRG/32 are as follows:

Reference		**Subject**
APAPPIRG C 32/7 *(Draft Conclusion CNS SG/25/02(ACSICG/08/02 (CRV/08/02)))*	-	Implementation of CRV for small Pacific Island and small ANSP in the region using CRV Solution, PCCWG SLA Package D
APANPIRG C 32/8 *(Draft Conclusion CNS SG/25/07 (SURICG/6/1))*	-	Interrogator Code (IC) Planning and Coordination
APANPIRG C 32/9 *(Draft Conclusion CNS SG/25/08(SURICG/6/2))*	-	Transition from II code to II and SI mixed code
APANPIRG C 32/10 *(Draft Conclusion CNS SG/25/09(SURICG/6/3))*	-	The APAC Regional Roadmap for Mode S Implementation

2.4 All APANPIRG/32 Conclusions related to CNS are included in **Attachment B** to this paper.

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

Election of Chair of SURSG

2.5 Mr. Vincent Wong, Acting Chief Electronics Engineer of the Air Traffic Engineering Services Division of the Hong Kong Civil Aviation Department (HKCAD), was elected as the chair of the surveillance study group (SURSG).

Surveillance Exchange Model Framework

2.6 Hong Kong, China presented some key considerations leading to a proposal of ANSP's collaboration scheme in sharing and enriching surveillance coverage for the region to benefit the aviation community. The sharing of surveillance data is expected to benefit the aviation industry in the APAC region given a more comprehensive and much wider map of surveillance coverage in the region. The paper explored ANSP's surveillance data sharing collaborative approach to expand surveillance coverage.

Proposed Solutions for Sharing of Surveillance Data

2.7 Singapore proposed solutions for States to share surveillance data and listed the pros and cons of the solutions. It was discussed that there are three models, namely distributed solution, central database, and hybrid model, which can potentially be used for the implementation of the data sharing. Detailed description, advantages, and disadvantages of each model were described. It was further informed that there might be some interested parties, who are not subscribers to CRV or without SWIM capabilities, but are keen to share their surveillance data with other States. Adjustments to the models will be required to accommodate these parties. One possible solution could be for these parties to connect directly to one or more of the centralized service data providers, if available.

Distribution of Surveillance Data to PNG via CRV

2.8 ICCAIA (Aireon) and Papua New Guinea jointly presented the status of Space based ADS-B data distribution using CRV. It was informed that NiuSky Pacific Limited has designed and is in the final stages of implementing a countrywide CNS/ATM modernisation program in PNG. In 2020, the CRV Operations Group authorised Aireon to connect and contract with the CRV provider. The contract has been signed by Aireon and NiuSky Pacific Limited. Aireon has established the first of two connections to CRV while NuiSky Pacific Limited implemented and tested the initial CRV connections. Space based ADS-B data can now be delivered to other Aireon customers in Asia Pacific via CRV, potentially without the need for any additional communication link or telecommunications costs**.** The meeting noted the implementation of Space-Based ADS-B system in PNG and in particular, that Space based ADS-B is now operational and one path is already using CRV.

Surveillance Data Sharing Platform

2.9 PCCW Global described the system architecture of PCCW SWIM service and its progresses to build its Surveillance data-sharing platform with EMS and Service Registry. The meeting was informed that PCCW Global is working with Frequentis Comsoft to host their SDDS-NG (Surveillance Data Distribution System – Next Generation) in PCCW SWIM for qualified States/Administrations/Stakeholders to publish or subscribe surveillance data by following the guidelines of the CRV OG & SWIM TF.

Proof-of-concept for surveillance data sharing on SWIM by Surveillance Study Group (SURSG)

2.10 Hong Kong, China proposed a proof-of-concept (POC) for surveillance data sharing on SWIM to be conducted in Hong Kong China for States' reference. Meeting noted that hybrid model has been successfully demonstrated during the SWIM in ASEAN Demonstration in November 2019 and is considered as a suitable infrastructure for SWIM implementation in APAC. A high-level system block diagram of the POC was shared. SURICG/6 expressed support to the POC and on-going work of the SURSG.

Proposed Concept of Operations for Surveillance Data Sharing

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

from SURICG for consideration by SURSG in formulating the CONOPS. SURICG/6 discussed the proposed Concept of Operations (CONOPS) by Hong Kong China on behalf of SURSG for sharing of surveillance data among multiple parties using the platform such as SWIM along with the objective of the CONOPS, so as to solicit suggestions/concerns from SURICG for consideration by SURSG in formulating the CONOPS.

ToR of Surveillance Study Group and Updates

2.12 The SURSG/1 meeting reviewed the ToR and made amendments on adding chair role and function, frequency of the meeting of SURSG, and the mode of the various task lead meetings for effective progress update, decision making, work assignments as they arise, and the need to update the list of contributing States as necessary. Based on the recommendation of SURICG/6 proposed by SURSG/1, CNS SG/25 reviewed the revised ToR of SURSG and adopted the **Decision CNS SG/25/12 (SURICG/6/6)**: Revised ToR of Surveillance Study Group (SURSG). The ToR is provided in **Appendix A** to this paper.

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

Interrogator Code (IC) Planning

2.13 The SURICG/6 meeting reviewed the proposal to amend formerly adopted APANPIRG Conclusions related to II codes and extend the consideration to the use of SI codes. After discussion, the SURICG/6 meeting endorsed the Draft Conclusion *SURICG/6/1 (Draft Conclusion DAPs WG/4/1, Draft Conclusion DAPs WG/4/2, Draft Conclusion DAPs WG/4/3)* - Interrogator Code (IC) Planning and Coordination for CNS SG/25 endorsement and APANPIRG/32 adoption. The conclusion was further adopted by APANPIRG/32 by **Conclusion APANPIRG C 32/8.**

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

2.15 The Secretariat provided the latest updates about Mode S II codes coordination in the APAC Region, and the ongoing discussion on allocation of II codes 14 and 15 with matching SI codes was shared. States were encouraged to provide updates and coordination with ICAO APAC Regional Office for updating the SSR II code list through appropriate focal points to eliminate duplicated II code implementation in overlapped coverage at boundary areas.

Transition to II and SI Mixed Code Operation

2.16 The SURICG/6 meeting reviewed the strategy of transition from II code to II and SI mixed code and the **Draft Conclusion CNS SG/25/08** *(SURICG/6/2) (DAPs WG/4/4)* - Transition from II code to II and SI mixed code was adopted by the CNS SG/25 for consideration in APANPIRG/32. The conclusion was further adopted by APANPIRG/32 by **Conclusion APANPIRG C 32/9.**

Roadmap for Mode S Implementation

2.17 The SURICG/6 meeting reviewed the revised Regional Roadmap proposed by DAPs WG/4 which defined the scope and rational steps for the implementation of Mode S in APAC region, and submitted by the *Draft Conclusion SURICG/6/3 (DAPs WG/4/5) - The APAC Regional Roadmap for Mode S Implementation* for adoption by CNS SG/25 and APANPIRG/32. The conclusion was further adopted by APANPIRG/32 by **Conclusion APANPIRG C 32/10.**

2.18 SURICG/6 noted the outcome of a *Survey on Current use and Future planning of Mode S Enhanced Surveillance (EHS) Implementation* resulted from an Action Item from Mode S DAPs

WG/4. The outcomes of the survey concluded that most of twelve States that responded to the survey are not facing any challenges in implementing APANPIRG/31/14 Conclusion. Additionally, the commercial fleet in APAC, North America, and MENA already possess Mode S ELS and EHS Mode S capability.

Mode S DAPs Implementation and Operations Guidance Document (IGD)

2.19 A proposal for revised draft Edition 3.0 of the Mode S DAPs Implementation and Operations Guidance Document (IGD) was discussed in SURICG/6. After review, CNS SG/25 adopted the **Conclusion CNS SG/25/10** *(SURICG/6/4) (DAPs WG/4/6) - Mode S DAPs Implementation and Operation Guidance Document* Edition 3.0.

Regional Supplement to ASTERIX Interface Control Document (ICD)

2.20 EUROCONTROL published the System Area Codes (SAC) for the various regions except for APAC. The DAPs WG/4 meeting proposed the considerations to publish the APAC SAC at the EUROCONTROL website. Additionally, States had their own control over the use of their System Identification Code (SIC) without the need for ICAO APAC to manage. As such, a *Conclusion CNS SG/25/11 (SURICG/6/5) (Draft Conclusion DAPs WG/4/7 and Draft Decision DAPs WG/4/8) - Revision of the Regional Supplement to ASTERIX Interface Control Document (ICD)* was endorsed in SURICG/6 and then was adopted by CNS SG/25.

2.21 The Secretariat presented the recent updates to the Regional Supplement to ASTERIX ICD for APAC Region and introduced the planning criteria and current usage of SAC in APAC region. SURICG/6 noted that current allotments would be enough to cater the actual and planned increase of surveillance sensors and automation systems in the APAC Region.

ADS-B Implementation

2.22 SURICG/6 reviewed the ADS-B Implementation Status in the APAC Region. SURICG/6 reviewed other documents through ad-hoc working groups on *ADS-B Data Sharing Implementation Status in the APAC Region* and Reports on the Sub-regional ADS-B Implementation Plan/Projects presented by South East Asia (SEA) and Bay of Bengal (BOB) Ad Hoc Working Groups. In addition, during the discussion in Ad Hoc Working Groups, some States had shared to the meeting that with the implementation of space-based ADS-B, the original ground-based ADS-B data sharing project would have to be re-evaluated.

2.23 FAA provided a description of two ADS-B avionics issues observed in the USA with DO-260B/ED-102A systems, its details and actions taken by FAA in the paper. SURICG/6 agreed to incorporate these issues in the paper into AIGD for easy reference in this region.

2.24 Aireon presented the status of space-based ADS-B as a service which has been operational for some time in various ANSPs. SURICG/6 noted that space-based ADS-B data was provided into APAC CRV network since 2020 and it is currently supporting Papua New Guinea (PNG) ATC operations. An example from NiuSky Pacific was explained to illustrate the benefits.

2.25 Boeing introduced their ADS-B implementation on their various models of different technology streams, which planned ahead for ADS-B Mandates in Europe and the United States. In addition, Boeing introduced the development of ADS-B solutions, including Airborne (AIRB) – Cockpit Display of Traffic Information (CDTI), Visual Separation on Approach (VSA) and In Trail Procedure (ITP).

Aircraft Address and Target Identification

2.26 In CNS SG/25, Hong Kong China presented the observation on recurring

inconsistencies of ICAO Aircraft Address and Target Identification between ADS-B / MLAT / Mode S data and flight plans for some aircraft flying within Hong Kong Flight Information Region despite repeated efforts had been spent to follow up with concerned airlines. As a result, **Conclusion CNS SG/25/13** *(SURICG/6/7) - Integrity of ICAO Aircraft Address* and Target Identification in ADS-B / MLAT / Mode S Data and Flight Plan was adopted to urge States/Administrations to proactively follow up with air operators to address such discrepancies.

ToR and AIGD

2.27 SURICG ToR was reviewed in SURICG/6 in the view of integration of SEA/BOB ADS-B WG ToR and presented by draft Decision for consideration of CNS SG/25 which was further adopted in CNS SG/25 as **Decision CNS SG/25/14** *(SURICG/6/8) - Revised ToR of Surveillance Implementation Coordination Group (SURICG).*

2.28 SURICG/6 considered the avionics issue on Honeywell Primus II RCZ to be included in AIGD and endorsed the Draft Conclusion SURICG/6/9 - Revised ADS-B Implementation and Operations Guidance Document (AIGD) for CNS SG/25 endorsement. The Draft Conclusion was further adopted by CNS SG/25 as **Conclusion CNS SG/25/15.**

Fifth Meeting of System Wide Information Management Task Force

Election of Co-Chair

2.29 *Ms. Kristin Cropf,* SWIM Program Manager, Federal Aviation Administration (FAA) nominated by Singapore and seconded by Australia and Japan was elected as Co-Chair of SWIM TF.

Expansion of the SWIM Implementation Philosophy

2.30 In SWM TF/5, Singapore presented the expansion of the SWIM Implementation Philosophy which was discussed at the SWIM TF/3 through WP/19. SWIM Implementation Philosophy described a 'bottom up' approach to SWIM implementation where it starts with picking a particular operational use case that can be better supported by SWIM. It was proposed that when developing services and conducting the technical/operational trials following a bottom-up approach, the governance concepts, rules, and/or recommendations should also be identified, implemented, and tested in parallel. Importantly, lessons learnt from implementing these governance concepts should be then reported back to the task force for further refinement. The meeting agreed on the expansion of the SWIM Implementation Philosophy to include governance. The meeting noted that implementation of governance is an iterative process and it will be modified based on the lesson learnt throughout the implementation of SWIM.

Asia/Pacific SWIM Implementation Plan and Status Survey

2.31 Considering the high diversity among Member States in the Asia/Pacific region, it was challenging to devise a regional plan to achieve region-wide harmonisation while not neglecting the constraints of each Member State. To create a baseline picture of SWIM implementation plan and status within the region, it was proposed to conduct a survey to obtain the current status and views towards SWIM implementation of the Asia/Pacific Member States. CNS SG/25 then adopted the **Conclusion CNS SG/25/03 (SWIM TF/5/01)** – Asia/Pacific SWIM Implementation Plan and Status Survey.

SWIM Infrastructure to Achieve Message Level Security

2.32 Japan, Thailand, and USA presented the technical implementation of security service on SWIM through a scenario-based validation and analysed some concerns and challenges to achieve end-to-end security through a SWIM-based trust framework. The meeting was reminded of the SWIM TI security capabilities as mentioned in the Manual on SWIM (Doc 10039). It was also informed that,

in order to validate the PKI based trust framework concept and the implementation of SWIM TI security capabilities, the test platform has been developed by the team of Multi-Regional Trajectory Based Operation (MR TBO) demonstration led by FAA. The high-level system architecture of MR TBO, the security service components as well as the approaches to implement SWIM TI security functional capabilities and non-functional qualities were discussed. The meeting was requested to provide the paper to Task 2, Task 3, Task 5, and Task 6 groups of SWIM TF along with CRV OG and ACSICG for deliberations. ACTION ITEM 5-4

FIXM version 4.2 Extension development

2.33 Thailand presented the update on FIXM version 4.2 Extension development to support the information exchange required for cross-border ATFM operations, ATFM/A-CDM integration, and FF-ICE/TBO in the Asia/Pacific Region along with a preliminary list of data attributes to be included in the FIXM version 4.2 Extension being developed. The meeting encouraged that other APANPIRG Working Groups and Task Forces, which are highly likely to have the operational requirements to use FIXM to support their related operations, should submit their consideration to SWIM TF in order to have Extension developed in due course if deemed necessary.

SWIM Discovery Service (SDS)

2.34 ROK and USA informed SWIM TF/5 about USA FAA and ROK Korea Airport Corporation (KAC) efforts to develop SWIM Discovery Service (SDS) to support transparent and replicable discovery of SWIM services in the APAC region. The paper described a brief summary of the SDS concept, the SDS demonstration environment, and scenario, and shared the lessons learned from the SDS effort.

SWIM Service Level Agreement (SLA)

2.35 USA described the enabling technologies and practices for instituting a SWIM Service Level Agreement (SLA) in the context of APAC SWIM in SWIM TF/5. The SWIM TF/5 meeting discussed that use case-3 SLA management with participation of SLA manager may be an appropriate reference for Asia/Pacific region. The next Task Leads coordination meeting may discuss in detail about the way forward for this proposal. It was also proposed that Task 5 group may provide a common SLA template, proposal on SLA management approach, and their validation methodologies.

SWIM Interoperability Assessment Matrix (SIAM)

2.36 USA introduced the SWIM Interoperability Assessment Matrix *(*SIAM) and how the SIAM can be used for interoperability assessments, articulation of requirements, and supporting the planning and validation of SWIM components in international geo-organisational settings. The paper concluded that SIAM provides a structural and systematic approach for evaluating interoperability in the context of global SWIM initiatives. It is designed to be used as a tool for supporting interoperability analysis and articulating requirements as well as for planning and validating. Furthermore, it is designed in a manner that promotes extensibility and scalability which may be modified to meet business requirements that may emerge in the future.

SWIM Registries and their metadata

2.37 Australia and Hong Kong China presented a review of currently existing SWIM Registries and their metadata fields and compared them to the proposed PANS-IM Service Overview fields. Recommendations were made with respect to additional APAC fields for initial version of APAC Service Overview Specification. The proposed additional Service Overview fields for the use in APAC and their advantages were presented. The meeting reviewed the proposed new APAC Service Overview fields and supported the draft version of APAC Service Overview Specification. The meeting suggested Task 6 to consider the addition of Service Overview elements taking into account this matter. Australia informed that, in order to capture the feedback and suggestions from the APAC SWIM community on

the extensions for SWIM Service Overviews, Australia has set up an "issues" list on GitHub, which can be accessed by the link: https://github.com/icao-apac/service-overview/issues and Australia will also publish the APAC SWIM Service Overview Extensions document at: https://icao-apac.github.io/service-overview/

Regional activities

2.38 IATA on behalf of SWIM TF provided a brief on key SWIM activities being undertaken in Asia & Pacific Region and primarily discussed at other ICAO APAC WG and TF meetings plus other industry meetings and webinars by WP/07 in SWIM TF/5. Mr. John Moore, IATA, informed that due to high workload, he would need to resign from the position of Task Lead of Task 10. However, he would continue to attend SWIM TF meetings, when available, and he will remain the point of contact between the SWIM TF and the airlines. He invited Member States for the nomination for Task Lead of Task 10 and for the contribution to SWIM TF. The meeting appreciated the contribution and consistent hard work of Mr. John Moore for SWIM TF in the last five years. The ICAO Secretariat and Co-Chairs of SWIM Task Force extended their gratefulness to Mr. John Moore for very concise and relevant information provided at various meetings.

ICAO APAC-SWIM Secure Portal

2.39 The ICAO Secretariat updated SWIM TF/5 meeting that IMP is in the process of developing a draft SWIM Manual Vol. II Implementation Guidance (Doc 10039) to provide top-level guidance. The participants and concerned parties were encouraged to provide and share SWIM related videos, training materials, and other useful information to SWIM TF and Secretariat for future compilation on **ICAO APAC-SWIM** Secure Portal. Dr. Amornrat Jirattigalachote added that APAC SWIM TF is not going to develop a new standard for Asia/Pacific region but SWIM TF need to streamline all outputs from various tasks and need to adopt technical specifications, regional exchange models, information services, etc. from a regional perspective.

SWIM TF Terms of Reference (ToR)

2.40 SWIM TF/5 meeting revised the ToR considering the progress made since the establishment of SWIM TF, the update of ICAO global and regional air navigation plans, and the revised task groups adopted at SWIM TF/4. The meeting endorsed Draft Decision SWIM TF/05/02-*Revised SWIM TF ToR* for adoption by CNS SG/25, which was further adopted by CNS SG/25 by **Decision CNS SG/25/04.**

2.41 Australia proposed some amendments via Flimsy/02 of CNS SG/25 to the draft ToR of SWIM TF. USA also shared its concern for using SWIM to transport time-critical information as detailed in WP/32 in CNS SG/25. The SWIM TF Co-Chairs advised the CNS SG/25 meeting that the draft ToR had been thoroughly discussed and agreed during the SWIM TF meeting. After some deliberations and taking into account views from CNS SG, the proposal on further modifying the term from **"over CRV"** to **"principally over CRV"** in the ToR was supported by China, Hong Kong China, Japan, Singapore, Thailand, USA, and IATA. The Decision CNS SG/25/04 was thus adopted and the revised ToR was provided in **Appendix B** to the paper. The CNS SG/25 meeting also remarked that ToR was a living document which needs to be reviewed in a regular and timely manner. The SWIM TF was also reminded to consider other IP-based network technologies in their forthcoming review on ToR.

2.42 The meeting noted that the subject on amendment to ToR of SWIM TF was also discussed by the MET SG/25, which was conducted in the same period with CNS SG/25, with a relevant **Draft Conclusion MET SG/25-07** *SWIM architecture to enable the cost-effective and efficient provision and consumption of MET information services* for consideration in APANPIRG/32. As the MET SG's draft conclusion will be captured in the ongoing review of SWIM /TF ToR and considering no further comments from members and the following, the meeting concluded that there was no need to further consider Draft Conclusion MET SG/25-07.

Experimental trial on surveillance data exchange in SWIM environment

2.43 ROK shared SWIM TF/5 about its experience on an experimental trial of surveillance data exchange in the SWIM environment and described motivation/requirements, system configuration/architecture, services, SWIM-enabled application, and lessons learned. Based on the experiences gained and the lessons learned by ROK, the meeting agreed to share the IP/05 with SURSG for further deliberations.

Updates on SWIM

2.44 Australia informed SWIM TF/5 that a key aspect for regional (and global) interoperability for SWIM is to define the Technical Infrastructure Profile for the participating stakeholders. Australia informed that currently, there are a number of Profiles in use (or defined) for SWIM (globally) and the most famous SWIM Profile is the EUROCONTROL Yellow Profile. Task 2 lead, responsible for APAC SWIM technical infrastructure development, responded to the five questions raised in the paper regarding the need for APAC Technical Infrastructure Profile. At initial stage, SWIM TF needs to support the APAC Member States to evaluate and build their SWIM capabilities and once some experiences are gained, SWIM Profile for APAC region may be developed. The meeting noted that SWIM TF may get some references related to SWIM Profile in SWIM Manual Vol II being developed by IMP.

2.45 Hong Kong China summarised the updates on the development of IWXXM as discussed in ICAO METP/5 and associated works being carried out by the ICAO METP working groups and WMO Task Team on Aviation Data (TT-AvData) to SWIM TF/5.

2.46 Japan, Singapore, Thailand, and USA presented an overview of MR TBO Demo, a collaborative project undertaken by Japan, Singapore, Thailand, USA, and Canada to validate TBO concept as well as to showcase the TBO operational values and technical capabilities required to support TBO in SWIM TF/5 meeting.

2.47 Thailand presented SWIM TF/5 about an overview of Thailand's SWIM implementation roadmap and lessons learnt during the planning process by WP/16. The meeting also considered utilising Thailand's SWIM implementation roadmap and SWIM knowledge sharing outline as inputs for the tasks to be conducted by Task 1 and Task 11, respectively. It was added that the survey proposed by Singapore and Thailand may use Thailand's SWIM implementation roadmap as a reference for preparation.

2.48 India presented in SWIM TF/5 meeting about the plan and progress of the Proof of Concept (POC) undertaken by India to prepare a roadmap for the ground-to-ground SWIM implementation.

2.49 China presented in SWIM TF/5 meeting the validation and demonstration of FIXM ATMB ATFM Extension Model whose purpose was to validate the feasibility and availability of FIXM extension model in China. China also presented the research progress and plans of Air-Ground SWIM in China, proposed an air-ground information exchange model, and a new SWIM architecture.

2.50 ROK presented the SWIM TF/5 meeting the status of SWIM as an ATM backbone network in the ROK and described the national roadmap to implement the local SWIM backbone network. ROK informed about its master plan of ATM and Navigational Aid systems and the master plan for the next five years to improve airport competitiveness, develop the aviation industry, strengthen interconnections, and prepare a systematic roadmap. ROK Roadmap for Transition to SWIM in two stages was explained and the drawing of its new aviation intra network including SWIM infrastructure deployment to exchange the real time information in a service-oriented architecture (SOA) for users was shared.

2.51 In SWIM TF/5 meeting, Australia shared a whitepaper discussing the role that Semantic Technologies will play in the future for the Aviation Industry and outlines a roadmap for SWIM services. Australia reviewed the current state of data standards in the aviation industry and looked at the pathway to a future of enhanced data capabilities, specifically, the use of Semantic Web technologies and the impact these will have on defining the strategic future for aeronautical, flight, and meteorological data services. It was presented in the paper that the roadmap to future needs wide industry consensus and planning and promises to deliver improved opportunities for data sharing, data automation, and data knowledge for safer skies. The meeting encouraged Member States to refer to the document titled Semantics in the Aviation Industry provided in Appendix to IP/07. Additionally, the meeting noted that https://semantics.aero/ currently hosts several semantic artefacts developed for the aviation domain.

2.52 China presented to SWIM TF/5 meeting about a hybrid networking solution compatible with legacy systems under IP backbone network and realised compatible transition between legacy systems and SWIM-enabled systems through emulation technology at the transport layer and data protocol conversion technology at the application layer.

Eighth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/8) and Eighth Meeting of the Common aeRonautical Virtual Private Network Operations Group CRV OG/8

CRV Implementation Plan- IP Addressing Scheme for Third Party Service Provider

2.53 Based on the recommendation of CRV OG/8 on adjusting the assigned IP address range in the CRV Implementation Plan for broadcasting space-based ADS-B data, the ACSICG/8 meeting endorsed the Draft Conclusion ACSICG/08/01(CRV/08/01) – *CRV Implementation Plan amendment* for adoption of CNS SG/25, which was later adopted by the CNS SG/25. By this conclusion, certain IP addresses are assigned to third party Service Provider (e.g. AIREON LLC providing Automatic Dependent Surveillance-Broadcast data over CRV) depending on Service Providers' technical requirements. The proposed CRV Implementation Plan amendment (Version 2.1) adopted by the CNS SG/25 meeting which can also be accessed at ICAO APAC e-documents portal at https://www.icao.int/APAC/Pages/eDocs.aspx

Use of CRV for Space based ADS-B

2.54 PNG discussed about the implementation of the Space-Based ADS-B system in PNG and in particular that Space-based ADS-B is now operational and one path is already using CRV for operational surveillance data. Space-based ADS-B is now available on the CRV and can be supplied to other ANSPs without the additional cost of dedicated point-to-point circuits. Meeting concluded that the Space Based ADS-B data on CRV is an extremely important step for future usage of CRV for purposes other than initially planned.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review the outcome of the APANPIRG/32 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/25 on behalf of APANPIRG on Technical Matters

Conclusion CNS SG/25/01 (*ACSICG/08/01(CRV/08/01)) – CRV Implementation Plan amendment (Version 2.1*)	
What: That, the CRV Implementation Plan be amended to include the following new text in paragraph 2.4.2 – IP Addressing iii. In the development of the IPv4 plan, a flexible margin has been designated to allow future growth or change. Through draft Conclusion CRV OG/8/01, using 10.46.0.1 to 10.46.255.254, each third party Service Provider (e.g. AIREON LLC providing Automatic Dependent Surveillance - Broadcast data over CRV) is assigned 254, 510, 764 or 1022 usable Network addresses (depending on Service Providers' technical requirements); and	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To allocate IP addresses to third party service providers for the delivery of services over CRV	Follow-up: ☐Required from States
When: 22-Oct-21	Status: Adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: ACSICG	

Conclusion CNS SG/25/03 (*SWIM TF/5/01) – Asia/Pacific SWIM Implementation Plan and Status Survey*	
What: To conduct a survey on SWIM implementation plan and status of Asia/Pacific Member States.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To establish a baseline understanding of SWIM implementation plan and status within the Asia/Pacific region so as to aid the development of the regional SWIM implementation roadmap.	Follow-up: ☒Required from States
When: 22-Oct-21	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SWIM TF	

Decision CNS SG/25/04 (*SWIMTF/05/02)* – Revised SWIM TF Terms of Reference	
What: That, the revised SWIM TF Terms of Reference (ToR) as shown in **Appendix F** to the report be adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To align with the progress made since the establishment of SWIM TF, the update of ICAO global and regional air navigation plans, and the revised task groups under SWIM TF adopted at SWIM TF/4.	Follow-up: ☐Required from States
When: 22-Oct-21	Status: Adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SWIM TF	

Conclusion CNS SG/25/05 – The Catalogue of Asia and Pacific Flight Inspection and Flight Validation Service Providers	
What: That, *The Catalogue of Asia and Pacific Flight Inspection and Flight Validation Service Providers* (Eleventh Edition) in the **Appendix G** to the report is adopted and be published on the ICAO Regional Office website.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The information in *The Catalogue of Asia and Pacific Flight Inspection and Flight Validation Service Providers Tenth Edition, April 2018)* need to be updated as per the recommendation of CNS SG/24	Follow-up: ☐Required from States
When: 22-Oct-21	Status: Adopted by Sub-group
Who: ☒CNS Sub-group ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion CNS/SG/25/06 - Update of Flight Inspection Guidance Material (FIGM) for APAC Region	
What: That, the Edition 2.0 of the Flight Inspection Guidance Material (FIGM) provided in **Appendix H** to the Report be adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The FIGM is subject to regular review and update, in the light of on-going development of flight inspection standards and recommended practices.	Follow-up: ☐Required from States
When: 22-Oct-21	Status:Adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion CNS SG/25/10 *(SURICG/6/4) (DAPs WG/4/6)* - Mode S DAPs IGD 3.0		
What: That, the *Mode S DAPs Implementation and Operation Guidance Document* Edition 3.0 provided in **Appendix J** to the 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: 22-Oct-2021	Status: Adopted by Sub-Group	
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SURICG		

<table>
<tr><td colspan="3">Conclusion CNS SG/25/11 (SURICG/6/5) (Draft Conclusion DAPs WG/4/7 and Draft Decision DAPs WG/4/8) - Revision of the Regional Supplement to ASTERIX Interface Control Document (ICD)</td></tr>
<tr><td colspan="2">What: ICAO APAC Regional Office to:
a) update EUROCONTROL with the latest SAC allocation within Asia Pacific; and

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

b) SIC is managed by State and there is little value for ICAO APAC to manage the SIC. Considering the workload to manage the SIC and the negligible benefits, it is proposed that ICAO APAC not to manage SIC.</td><td>Follow-up:
☐Required from States</td></tr>
<tr><td>When: 22-Oct-2021</td><td colspan="2">Status: Adopted by Sub-Group</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: SURICG</td></tr>
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<tr><td colspan="3">Decision CNS SG/25/12 (SURICG/6/6): Revised ToR of Surveillance Study Group (SURSG)</td></tr>
<tr><td colspan="2">That, the Revised Terms of Reference of the Surveillance Study Group (SURSG) provided in Appendix L to the report be adopted.</td><td>Expected impact:
☐ Political /Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: The SURSG/1 meeting reviewed the ToR and made amendments on adding chair role and function, frequency of the meeting of SURSG and the mode of the various task lead meetings for effective progress update, decision making, work assignments as they arise and the need to update the list of contributing States as necessary.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 22-Oct-2021</td><td colspan="2">Status: Adopted by Sub-Group</td></tr>
<tr><td colspan="3">Who:☒Sub groups ☐ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐APANPIRG ☒ Other: SURICG</td></tr>
</table>

Conclusion CNS SG/25/13 (SURICG/6/7) - Integrity of ICAO Aircraft Address and Target Identification in ADS-B / MLAT / Mode S Data and Flight Plan	
What: To urge States/Administrations to proactively follow up with air operators to address discrepancies of ICAO Aircraft Address and Target Identification between ADS-B / MLAT / Mode S data and flight plan.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Such discrepancies will cause safety implications in ATC operation and induce additional workload to controllers and supporting staff in handling the cases.	Follow-up: ☒Required from States
When: 22-Oct-2021	Status: Adopted by Sub-group
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SURICG	

Decision CNS SG/25/14 (SURICG/6/8): Revised ToR of Surveillance Implementation Coordination Group (SURICG)	
That, the Revised Terms of Reference of the Surveillance Implementation Coordination Group (SURICG) provided in **Appendix N** to the report be adopted.	Expected impact: ☐ Political /Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The ToR from dissolved SEA/BOB ADS-B WG was reviewed and necessary updates were identified.	Follow-up: ☐Required from States
When: 22-Oct-2021	Status: Adopted by Sub-Group
Who:☒Sub groups ☐ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐APANPIRG ☒ Other: SURICG	

Conclusion CNS SG/25/15 (SURICG/6/9) - Revised ADS-B Implementation and Operations Guidance Document (AIGD)	
What: That, the revised ADS-B Implementation and Operations Guidance Document (AIGD) provided in **Appendix O** to the report, which consolidated all change proposals during SURICG/6, is adopted as Version 14.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Updates from SURICG/6	Follow-up: ☐Required from States
When: 22-Oct-2021	Status: Adopted by Subgroup
Who: ☒CNS Sub group ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☒ Other: SURICG	

Decision CNS SG/25/16 (ATMAS TF/2/1 (APA TF/7/1)) - Dissolution of APA TF	
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 undertaken by ATMAS TF. That, the APA TF be dissolved.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The APA TF Terms of Reference have been completed and pending action items will be undertaken by ATMAS TF.	Follow-up: ☐Required from States
When: 22-Oct-2021	Status: Adopted by Sub-Group
Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: ATMAS TF	

Decision CNS SG/25/17 (ATMAS TF/2/2) – Revised ATMAS TF Terms of Reference	
What: That, the revised ATMAS TF Terms of Reference (ToR) as shown in **Appendix P** of the Report be adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: After dissolution of the APA TF, the ongoing APAC regional AIDC work will be conducted by ATMAS TF.	Follow-up: ☐ Required from States
When: 22-Oct-21	Status: Adopted by Sub-Group
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: ATMAS TF	

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A List of Conclusions adopted by APANPIRG/32 Meeting related to CNS

<table>
<tr><td colspan="3">Conclusion APANPIRG/32/7 (CNS SG/25/02) - Implementation of CRV for small Pacific Island and small ANSP in the region using CRV Solution, PCCWG SLA Package D.</td></tr>
<tr><td colspan="2">What: That, the CRV OG should consider the following to assist small Pacific Islands & small ANSP in APAC in the implementation of CRV:
a) Small Pacific Island and small ANSP in the region to consider using CRV SLA package D as the CRV solutions to implement CRV for the exchange of voice & AMHS services
b) With target date to implement CRV by the end of 2021 by APANPIRG Conclusion C 31/12, it is recommended that the CRV OG to work closely with the small Pacific Islands, small ANSP in the region and PCCWG on a cost effective CRV solution to implement CRV.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To facilitate the implementation of CRV for the small Pacific Island & small ANSP in the region</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 03-Dec-2021</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: ACSICG</td></tr>
</table>

<table>
<tr><td colspan="2">Conclusion APANPIRG/32/8 (CNS SG/25/07) - Interrogator Code (IC) Planning and Coordination</td></tr>
<tr><td>What: That,

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

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

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

b) while implementing SSR Mode S, States should take into account following issues while assigning IC for these installations:
• for planning the implementation of SSR Mode S interrogators, administrations should ensure that the interrogators with overlapping coverage are not operating with the same IC.
• where, the coverage of the interrogator extends beyond the boundaries of the State, The IC should be worked out in</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
</table>

coordination with the ICAO Asia and Pacific Office and the neighbouring States concerned, and • administrations should inform the ICAO Asia and Pacific Office about the assigned IC for these installations. *Coordination Requirements for SSR Mode S Interrogator Codes (IC) (formerly* **Conclusion 20/56***)* States be advised to provide the following information on SSR Mode S Interrogator Code to the ICAO Asia/Pacific Office for coordination and registration. a) Name of country/territory and location of facility; b) Antenna Coordinates (Latitude and Longitude); c) Elevation of antenna above the Mean Sea Level (MSL) in meters; d) Maximum Coverage of SSR Mode S Interrogator in nautical mile; e) II Code (1 to 15) or SI Code (1 to 63); and f) Remarks (special configuration such as radar clustering, lockout override, II/SI mode capability) *Planning Criteria for SSR Mode S Interrogator Code (IC) Assignment (formerly* **Conclusion 20/57***)* The planning criteria for SSR Mode S IC coordination and assignment as provided in Appendix J of Doc 9924 (Third Edition, 2020) be adopted for use in the Asia/Pacific Region.	
Why: Due to higher density of radars, some States are facing a shortage of II codes. It has to be solved by transiting from II to SI code. It is noted that state may use a mixture of II and SI codes before complete migration to SI code. The assignment of interrogator codes (IC), where necessary in areas of overlapping coverage, across international boundaries of flight information regions, shall be the subject of regional air navigation agreements. States still have to coordinate with ICAO APAC Regional Office on the allocation of II codes and SI codes.	Follow-up: ☒Required from States
When: 03-Dec-2021	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: SURICG	

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

Conclusion APANPIRG/32/9 *(CNS SG/25/08)* - Transition from II code to II and SI mixed code	
What: States with Mode S radar capable of performing II/SI mode operations are encouraged to transit from II code to II and SI mixed code, so as to ease the shortage of II codes. States planning to perform	Expected impact: ☐ Political / Global

the transition shall coordinate with ICAO APAC Regional Office to obtain the SI codes.	☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: Due to higher density of radars, some States are facing a shortage of IC codes, which has to be solved by transiting from II to II and SI mixed code. It is noted that radars using II and SI codes can co-exist, hence there is no need for a big bang approach. However, States still have to coordinate with ICAO APAC Regional Office on the allocation of SI codes.	Follow-up: ☒Required from States
When: 03-Dec-2021	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: SURICG	

Conclusion APANPIRG/32/10 *(CNS SG/25/09)* - The APAC Regional Roadmap for Mode S Implementation	
What: That, the APAC Regional Roadmap for Mode S Implementation provided in **Appendix D** to the Report on Agenda Item 3.4 be adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: The revised Roadmap defined the scope and rational steps for the implementation of Mode S in APAC region.	Follow-up: ☒Required from States
When: 03-Dec-2021	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: SURICG	

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Revised TERMS OF REFERENCE

STUDY GROUP UNDER SURICG ON SHARING OF SURVEILLANCE DATA IN SWIM

Working Arrangement of the Study Group

Membership: The Study Group under SURICG on Sharing of Surveillance Data in SWIM ("Study Group", "SURSG**"** as acronym) shall be composed of subject matter experts from Member States involved in the provision of surveillance services and SWIM development as well representatives from Member States with an interest to contribute to the works of the SURSG. The SURSG may invite representatives of International Organizations recognized by the ICAO Council, Industry Partners or interested parties representing important civil aviation interests to participate in its work in consultative capacity.

Participants of SURSG/1 *(in alphabetical order)***:**

Australia, China, Hong Kong - China, India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Thailand, United States, Viet Nam, CANSO, IATA, ICCAIA.

The SURSG shall have one elected Chair.

The SURSG shall have Task Leads and Sub-Task Leads for tasks detailed in the "Deliverables to meet the Objectives", which currently features 4 main Tasks together with their sub-tasks. Members may volunteer to subscribe to the tasks and sub-tasks. Task Leads and Sub-Task Leads are to be selected through coordination and agreement among the respective task or sub-task subscribers.

Meetings: While the SURSG is established in ad hoc nature, it shall convene face-to-face/web meeting to achieve its TOR. Outcome of its meetings shall be reported to and sought endorsement from the SURICG. Progress of the SURSG shall also be shared with SWIM TF and CRV OG via their nominated representatives joining the SURSG.

Task Leads and Sub-Task Leads shall convene meetings as necessary and in formats as appropriate to discuss and work on their tasks to achieve the scheduled deliverables making reference to Deliverables Template, a temple of which is provided on the last page of this ToR.

Task Leads and Sub-Task Leads shall attend the SURSG meetings and in between SURSG meetings, ad-hoc or regular meetings to harmonize their work or resolve issues.

Schedule and delivery: Subject to the extent of prioritized applications considered by the SURSG, the schedule for delivery of the SURSG shall be decided by the SURSG, which shall update the SURICG accordingly.

The Objectives of Study Group are to:

1) Study, provide expert views and recommendations:
    a) to achieve harmonized sharing of surveillance data in SWIM in the Asia and Pacific Regions (APAC) according to Surveillance Strategy adopted by APANPIRG and in support of ICAO's GANP and ASBU initiatives; and

b) on the possible models of sharing surveillance data in SWIM in the SWIM environment, in consideration of the SWIM technical infrastructure, SWIM information service, CRV infrastructure and any applicable governance, and technical requirements.

2) Review, identify and provide expert views and recommendations to address major issues, raised to the SURSG by ICAO APAC, in the technical, operational or regulatory aspects of surveillance data sharing to facilitate the implementation of surveillance from "departure to destination" in APAC.

Deliverables to meet the Objectives:

1) To submit not fewer than 1 Progress Report per year to SURICG and SWIM TF, with the latest report submitted at least 2 months prior to convening of the SURICG meeting on the Study Group deliverables (listed in 2 to 4 below);

2) To study, identify and make recommendations on the **possible and practical** models for surveillance data sharing in SWIM in APAC with considerations of:

a) Concept of use/operation;
b) System design considerations of individual participant that shares surveillance data such as system robustness, data security and integrity, data latency, fallback arrangements and system recovery;
c) General requirements from perspective of collaborative sharing of surveillance data such as centralized/decentralized surveillance data processing, data repository, service registry, service resilience and service recovery;
d) Required commitments of data sharing participants such as commitment of resources and costs;
e) Implementation roadmap and time frames with consideration of
    (i) An incremental approach/a comprehensive approach at the outset;
    (ii) Type(s) of surveillance data to be shared; and
    (iii) Information exchange model for surveillance data in SWIM;
f) SWIM technical infrastructure, SWIM information service, CRV infrastructure;
g) Other currently available or emerging technologies; and
h) ICAO Global Air Navigation Plan (GANP) and Aviation System Block Upgrades (ASBU) as well as APAC Seamless ANS Plan.

3) To prepare, based on its works in 2) above, a report on the possible implementation of surveillance data sharing in SWIM in APAC inclusive of the following:

a) Recommendations for:
    (i) An incremental approach/a comprehensive approach at the outset in surveillance data sharing;
    (ii) Type(s) of surveillance data to be shared; and
    (iii) Exchange model of surveillance data in SWIM.
b) Pros and cons and cost effectiveness for the possible models that have been considered and a recommendation on the best approach or parallel approaches;
c) Concept(s) of Operations of the recommended approach(es);

d) Required commitments of participating Member States who share their surveillance data;
e) Required commitments of Member States who access the shared surveillance data; and
f) Draft multi-lateral agreement on surveillance data sharing and data consumption.

4) To develop guidance materials to assist Members States participating in the sharing of surveillance data and Member States accessing the shared surveillance data.

Template of Deliverables

		Efforts thus far
1	Study, provide expert views and recommendations: a) to achieve harmonized sharing of surveillance data in SWIM in the Asia and Pacific Regions (APAC) according to Surveillance Strategy adopted by APANPIRG and in support of ICAO's GANP and ASBU initiatives; and b) on the possible models of sharing surveillance data in SWIM environment, in consideration of the SWIM technical infrastructure, SWIM information service, CRV infrastructure, and any applicable governance, and technical requirement.	
2	Review, identify and provide expert views and recommendations to address major issues, raised to the SURSG by ICAO APAC, in the technical, operational or regulatory aspects of surveillance data sharing to facilitate the Mode S DAPs implementation in APAC.	
Deliverables to meet the Objectives:		**Efforts thus far**
1	To submit not fewer than 1 Progress Report per year to SURICG and SWIM TF , with the latest report submitted at least 2 months prior to convening of the SURICG meeting on the SURSG deliverables (listed in 2 to 4 below)	
2	To study, identify and make recommendations on the possible and practical models for surveillance data in SWIM in APAC with considerations of : a) Concept of use/operation; b) System design considerations of individual participant that shares surveillance data such as system robustness, data security and integrity, fallback arrangements and system recovery; c) General requirements from perspective of collaborative sharing of surveillance data such as centralized/decentralized surveillance data processing, data repository, service registry, service resilience and service recovery; d) Required commitments of data sharing participants such as commitment of resources and costs;	

	e) Implementation roadmap and time frames with consideration of: (i) An incremental approach/a comprehensive approach at the outset; (ii) Type(s) of surveillance data to be shared; and (iii) Information exchange model for surveillance data in SWIM. f) SWIM technical infrastructure, SWIM information service, and CRV infrastructure; g) Other currently available or emerging technologies; and h) ICAO Global Air Navigation Plan (GANP) and Aviation System Block Upgrades (ASBU).	
3	To prepare, based on its works in 2) above, a report on the possible implementation of surveillance data sharing in SWIM in APAC inclusive of the following: a) Recommendations for: (i) An incremental approach/a comprehensive approach at the outset in surveillance data sharing; (ii) Type(s) of surveillance data to be shared; and (iii) Information Exchange model for surveillance data in SWIM. b) Pros and cons and cost effectiveness for the possible models that have been considered and a recommendation on the best approach or parallel approaches; c) Concept(s) of Operations of the recommended approach(es); d) Required commitments of participating Member States who share their surveillance data; e) Required commitments of Member States who access the shared surveillance data; and f) Draft multi-lateral agreement on surveillance data sharing and data consumption.	
4	To develop guidance materials to assist Members States participating in the sharing of surveillance data and Member States accessing the shared surveillance data.	

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Presentation of the initial proposal:

1. The *Background* and *Comments* are provided in *italic text*.

2. The text of the proposed amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

a)	~~Text to be deleted is shown with a line through it.~~	text to be deleted
b)	New text to be inserted is highlighted with grey shading.	new text to be inserted
c)	~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

TERMS OF REFERENCE

SWIM Task Force

Objectives: In order to achieve ~~B1-SWIM~~ the SWIM thread as specified in the Aviation System Block Upgrade (ASBU) of the Global Air Navigation Plan (GANP) ~~and~~, the Asia/Pacific Seamless ~~ATM~~ ANS Plan objectives, and the ~~ATM and AIM~~ air navigation systems ~~–~~that are in compliance with ICAO global standards for the conceptualisation and exchange of aeronautical, flight and meteorological information~~– should be implemented in the high-density FIRs and high-density international aerodromes by November 2022 (PASL Phase III) and in all FIRs and international aerodromes by November 2025 (PASL Phase IV). To that end~~, the SWIM Task Force will:

a) Benchmark the various successful implementations of SWIM in States and regions to ~~adopt~~ promote best practices;

b) Develop and maintain ~~a~~ the Asia/Pacific regional roadmap for SWIM ~~services (ATM, AIM, MET, other), dependencies and enablers~~ implementation, including SWIM technical infrastructure, SWIM governance, SWIM information services;

c) ~~Liaise with relevant regional contributory bodies to refine operational and communications requirements (example: ATFM/SG, AAITF, MET IE/WG, ACSICG, CRV/OG, etc.)~~ Define a high-level Asia/Pacific regional SWIM architecture, the corresponding SWIM technical infrastructure requirements, and the implementation approach to construct such architecture principally over CRV to ensure interoperability among regional SWIM participants and to support transition for non-SWIM capable entities;

d) ~~Complement global SWIM governance with regional procedures as needed and define how it can be implemented in APAC, with a particular focus on version management of concept and exchange models, architecture models, cyber security, data quality management and maintenance of a trusted environment~~ Develop the Asia/Pacific

regional SWIM cyber security architecture framework and SWIM security strategy in line with ICAO International Aviation Trust Framework (IATF);

e) ~~Provide guidance and training to APAC member States and APANPIRG contributory bodies involved in SWIM related work~~ Support APANPIRG WGs/TFs regarding information exchange models and examine if any extension to the existing information exchange models, i.e. AIXM, FIXM, and IWXXM, and/or the new information exchange model(s) are required to support the Asia/Pacific regional operational requirements;

f) ~~Develop guidance/requirements for publishers/service providers and subscribers/service consumers~~ Establish a robust and sustainable governance model to ensure that a common set of policies, rules, and standards for identifying, designing, implementing, discovering, and operating SWIM-enabling components, including SWIM registries, is consistently applied and enforced throughout the Asia/Pacific region;

g) ~~Promote enablement of ATM services as SWIM Application Services (SAS)~~ Develop and define the Asia/Pacific version of the SWIM information service overview specifications and the Asia/Pacific version of data catalogue for information services based on the regional operational needs;

h) ~~Define how SWIM Registry/Registries and services will be implemented in the APAC region and what the minimum level of information a service needs to provide to the Registry/Registries~~ Track and observe SWIM demonstrations and trials within the Asia/Pacific region as well as provide, if required, support for regional SWIM demonstrations;

i) ~~Support APANPIRG WG/TF regarding data exchange models of AIXM, FIXM, and IWXXM and examine if any extension is required for the operational use in APAC~~ Construct a platform for SWIM services and applications validation and support the implementation of SWIM services and applications;

j) Monitor developments by the IMP and escalate the regional issues as required;

k) ~~Implement the APAC Regional SWIM~~ Identify, communicate, and liaise with relevant APANPIRG WGs/TFs in regard to SWIM-related activities, including providing support to refine SWIM operational and communications requirements; ~~and~~

l) ~~Undertake any other tasks related to SWIM implementation that may arise in the future~~ Develop an educational and promotional materials required to support the regional SWIM implementation to ensure cohesiveness among regional SWIM participants;

m) Implement the Asia/Pacific regional SWIM; and

n) Undertake any other tasks related to SWIM implementation that may arise in the future.

~~Considering the cross-disciplinary nature of SWIM, the Task Force will ensure proper coordination with relevant regional contributory bodies under APANPIRG.~~

Composition:

The SWIM TF will consist of experts from ATM, AIM, MET, and CNS from Asia/Pacific States ~~(ANS Providers),~~ and international organizations such as ~~from~~ IATA and ICCAIA.

Conduct of the work:

The task force will conduct its work through ~~Web Conferences~~ web conferences, teleconferences, other electronic means of communications, and Face-to-Face meetings.

Reporting:

The group will report to CNS SG.

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TERMS OF REFERENCE

SWIM Task Force

Objectives: In order to achieve the SWIM thread as specified in the Aviation System Block Upgrade (ASBU) of the Global Air Navigation Plan (GANP), the Asia/Pacific Seamless ANS Plan objectives, and the air navigation systems that are in compliance with ICAO global standards for the conceptualisation and exchange of aeronautical, flight and meteorological information, the SWIM Task Force will:

a) Benchmark the various successful implementations of SWIM in States and regions to promote best practices;

b) Develop and maintain the Asia/Pacific regional roadmap for SWIM implementation, including SWIM technical infrastructure, SWIM governance, SWIM information services;

c) Define a high-level Asia/Pacific regional SWIM architecture, the corresponding SWIM technical infrastructure requirements, and the implementation approach to construct such architecture principally over CRV to ensure interoperability among regional SWIM participants and to support transition for non-SWIM capable entities;

d) Develop the Asia/Pacific regional SWIM cyber security architecture framework and SWIM security strategy in line with ICAO International Aviation Trust Framework (IATF);

e) Support APANPIRG WGs/TFs regarding information exchange models and examine if any extension to the existing information exchange models, i.e. AIXM, FIXM, and IWXXM, and/or the new information exchange model(s) are required to support the Asia/Pacific regional operational requirements;

f) Establish a robust and sustainable governance model to ensure that a common set of policies, rules, and standards for identifying, designing, implementing, discovering, and operating SWIM-enabling components, including SWIM registries, is consistently applied and enforced throughout the Asia/Pacific region;

g) Develop and define the Asia/Pacific version of the SWIM information service overview specifications and the Asia/Pacific version of data catalogue for information services based on the regional operational needs;

h) Track and observe SWIM demonstrations and trials within the Asia/Pacific region as well as provide, if required, support for regional SWIM demonstrations;

i) Construct a platform for SWIM services and applications validation and support the implementation of SWIM services and applications;

j) Monitor developments by the IMP and escalate the regional issues as required;

k) Identify, communicate, and liaise with relevant APANPIRG WGs/TFs in regard to SWIM-related activities, including providing support to refine SWIM operational and communications requirements ;

l) Develop an educational and promotional materials required to support the regional SWIM implementation to ensure cohesiveness among regional SWIM participants;

m) Implement the Asia/Pacific regional SWIM; and

n) Undertake any other tasks related to SWIM implementation that may arise in the future.

Composition:

The SWIM TF will consist of experts from ATM, AIM, MET, and CNS from Asia/Pacific States and international organizations such as IATA and ICCAIA.

Conduct of the work:

The task force will conduct its work through web conferences, teleconferences, other electronic means of communications, and Face-to-Face meetings.

Reporting:

The group will report to CNS SG.

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