

International Civil Aviation Organization



ICAO

**SIXTH MEETING OF MODE S AND DOWNLINKED
AIRCRAFT PARAMETERS WORKING GROUP
(MODE S AND DAPS WG/6)**

Bangkok, Thailand, 28 – 30 March 2023

Agenda Item 2: Review outcomes of relevant meetings

REVIEW OF RELEVANT ICAO MEETINGS

(Presented by the Secretariat)

SUMMARY

The paper presents the relevant outcomes of the meetings held in 2022 including the thirty third Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/33), the twenty sixth meeting of Communications, Navigation, and Surveillance sub-group (CNS SG/26) and relevant discussions in other meetings.

1. INTRODUCTION

1.1 The Thirty-third Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/33) was hosted by Indonesia at the Trans Resort Bali in Bali, Indonesia *from 22 to 24 November 2022* as a hybrid event (in-person and virtual participation). The Meeting was attended by **326** participants from **30** Member States, **2** Special Administrative Regions of China, and **7** International Organizations (ACI, CANSO, IATA, ICAO, IFALPA, IFATSEA and PASO). The APANPIRG/33 meeting report, working papers, information papers, and other resources can be accessed by the following link:

<https://www.icao.int/APAC/Meetings/Pages/2022-APANPIRG33.aspx>

1.2 The Twenty Sixth Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/26) of APANPIRG was held *from 5 to 9 September 2022* via Video Tele-Conference (VTC) using Microsoft Teams. The meeting was attended by **247** participants from **26** States/Administrations, and **4** International Organizations, including 21 participants from industry partners. The CNS SG/26 meeting report, working papers, information papers, and other resources can be accessed by the following link:

<https://www.icao.int/APAC/Meetings/Pages/2022-CNS-SG-26.aspx>.

1.3 The APANPIRG/33 meeting reviewed the outcomes of the CNS SG/26 and noted with appreciation the work done and achievements by the CNS SG and the contributory bodies reporting to APANPIRG through the CNS SG. The meeting discussed CNS-related matters and took actions discussed in the next section on the report of CNS SG/26 meeting and other papers presented under Agenda Item 3.4 of APANPIRG/33.

1.4 This paper summarized relevant information and updates with the highlight of the reviewed outcomes of relevant discussions of other meetings of CNS SG/26 and APANPIRG/33.

2. DISCUSSION

The actions taken by APANPIRG/33 meeting on Aeronautical Spectrum and Frequencies related matters are highlighted in blue below:

2.1 The CNS SG/26 meeting adopted the following **5** Conclusions and **2** Decisions:

Reference	Subject
Conclusion CNS SG/26/03 (<i>ACSICG/09/04</i>)	- Revised AFTN/ATSMHS Routing Directory
Decision CNS SG/26/04 (<i>SWIM TF/06/01</i>)	- The Use of the Internet for MET Information Services in Regional SWIM architecture
Decision CNS SG/26/07 (<i>SWIM TF/06/06</i>)	- Revised SWIM TF Terms of Reference
Conclusion CNS/SG/26/09	- Update of Flight Inspection Guidance Material (FIGM)
Conclusion CNS SG/26/10 (<i>SURICG/7/1 (DAPs WG/5/1)</i>)	- Mode S DAPs IGD 4.0
Conclusion CNS SG/26/12 (<i>SURICG/7/4</i>)	- Revised ADS-B Implementation and Operations Guidance Document (AIGD)
Conclusion CNS SG/26/13 (<i>ATMAS TF/3/1</i>)	- ATMAS IGD Edition 1.0

2.2 The contents of the above Conclusions/Decisions adopted by the CNS SG/26 are provided in **Attachment A** to this paper.

2.3 Based on the outcome of discussions on various agenda items, the CNS SG/26 meeting developed **5** Draft Conclusions and **1** Draft Decision for consideration by APANPIRG/33 Meeting, which were further adopted by APANPIRG/33. The Conclusions/Decisions adopted by APANPIRG/33 are as follows:

Reference	Subject
Conclusion APANPIRG/33/6 (<i>CNS SG/26/01 (ACSICG/09/01 (CRV OG/09/01))</i>)	- Revised Amendment of the Management Service Agreement for CRV project (RAS14801)
Conclusion APANPIRG/33/7 (<i>CNS SG/26/02 (ACSICG/09/02 (CRV OG/10/01))</i>)	- Extension of CRV Contract for one year.

- Decision APANPIRG/33/8** (CNS SG/26/05 (SWIM TF/06/03)) - Harmonization of Timelines for SWIM-related Initiatives
- Conclusion APANPIRG/33/9** (CNS SG/26/06 (SWIM TF/06/02, SWIM TF/06/04)) - The Asia-Pacific SWIM Implementation Timeframe and inclusion of the Asia/Pacific SWIM Implementation in the Asia/Pacific Seamless ANS Plan
- Conclusion APANPIRG/33/10** (CNS SG/26/08 (SRWG/6/2)) - Planning Principle for Aeronautical Frequency Bands of 108-117.975 MHz, 960-1215 MHz and 117.975-137 MHz
- Conclusion APANPIRG/33/11** (CNS SG/26/11 (SURICG/7/3)) - [Revised Surveillance Strategy for the APAC Region](#)

2.4 All APANPIRG/33 Conclusions related to CNS are provided in **Attachment B** to this paper.

2.5 The following captures the highlights of previous discussions relevant to this Meeting.

Review Outcomes of Mode S DAPs WG/5

2.6 The outcomes of Mode S DAPs WG/5 were reviewed in SURICG/7 and subsequently CNS SG/26, and the papers and issues discussed are summarised as follows:

- APAC Regional Workshop on Mode S Implementation
- Update on Interregional IC Coordination
- Guidance Material for Assignment of Interrogator Codes (IC) for MLAT and ADS-B
- Reservation of IC Codes 14 and 15 for Research and Military
- Options for Vacating the SSR Mode S II Codes 14 and 15 in the APAC Region
- Update on Mode S IC Code Module in Frequency Finder
- An Abnormal Problem of CPR Decoding caused by the Incorrect Air-ground State of an Aircraft in China
- Mode S Interrogator Codes Allocation and Conflict Analyses
- Progress on the Trials of Mode S Surveillance Co-ordination Network in China
- Upper Air Wind Speed Estimation based on Mode S SSR DAPs
- Suggestions of Performance Parameters and Benchmarking of Radar System for APAC Region
- SI Operation Plan at Incheon Airport
- A GPS Interference Identification Method based on ADS-B Data
- An Evaluation Example of a Non-Cooperative Method for DAPS Data Recognition
- Management of 1030/1090MHz Utilization
- Roadmap on Mode S Implementation for APAC Region
- Planning Criteria for II/SI Code Assignment
- Mode S DAPs Implementation and Operations Guidance Document (Mode S DAPs IGD) Edition 4.0

Latest Updates to Frequency Finder Tool

2.7 The latest work, enhancements and functionalities brought to the Frequency Finder tool were discussed to assist ICAO Regional Offices and States to manage and coordinate SSR Mode S II/SI codes, and aeronautical frequency assignments in ICAO COM Lists 2 and 3. Enhanced feature of a global database for Mode S II/SI code assignments was introduced in the latest version. The meeting

was invited to make extensive usage of the Frequency finder tool and provide feedback on the usage, suggestions, bugs and recommendations.

Clarification of II/SI Code Allocation in Doc 9924 Appendices H and J

2.8 China, Singapore and the ICAO Secretariat shared the current proposals in SURICG/7 IP/03 for amending the Aeronautical Surveillance Manual (Doc. 9924) Appendix H and J. Amendments in Appendix H will clarify the steps that can be taken to secure a safe introduction of Mode S II/SI capable interrogators and transponders with the focus on an environment where both Mode S II only and Mode S II/SI capable systems are being introduced. Amendments in Appendix J will update the Mode S II code assignment planning with Mode S SI code and provide for compatibility with Mode S interrogators and transponders that are not Mode S SI capable. Enhancement of the material would help States and regions migrate from II to SI under a mixed environment. Following the discussion at the Aeronautical Surveillance Working Group in Apr 2022, EUROCONTROL proposed improvements to the document. The proposed text provided in the Meeting was still being worked out, and SP Chair commented that the enhancement work could be completed by SP/5 in fall 2023.

Point of Contact for Mode S Matters

2.9 The CNS SG/26 meeting supported the suggestion from the ICAO Secretariat on the need for DAPs WG to set up the list of Points of Contact for Mode S matters, such as the Mode S Interrogator Identifier (II)/ Surveillance Identifier (SI) code coordination. The SURICG Co-Chair suggested that States to present surveillance related implementation matters in SURICG or its contributory bodies meetings first before considering to present in higher level meetings such as CNS SG / APANPIRG.

Update of ToR

2.10 SURICG/7 reviewed and deliberated the proposal from DAPs Working Group to rename the Group and update its Terms of Reference (ToR) to better reflect the current work scope that covers not only DAPs but also Mode S radars. After deliberation, SURICG/7 considered it appropriate to rename the Group as “Mode S and DAPs Working Group”, and endorsed the Decision SURICG/7/2.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the outcome of the APANPIRG/33, CNS SG/26, and relevant contributory bodies, and take any necessary follow-up actions; and
- b) discuss any relevant matters as appropriate.

List of Conclusions/Decisions adopted by CNS SG/26 on behalf of APANPIRG on Technical Matters

Conclusion CNS SG/26/03 (ACSICG/09/04) - Revised AFTN/ATSMHS Routing Directory	
What: That, the AFTN/ATSMHS Routing Directory for the APAC Region provided in Appendix B to the report be further updated and distributed to States/Administrations as 29 th Edition.	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: A number of new ATSMHS connections have been established and became operational. Consequential amendments to the AFTN/ATSMHS Routing Directory are required.	Follow-up: <input type="checkbox"/> Required from States
When: 9-Sep-22	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> CNS SG <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/26/04 (SWIM TF/06/01) - The Use of the Internet for MET Information Services in Regional SWIM architecture	
What: That, the use of Internet for meteorological information services will be considered in designing the regional SWIM architecture.	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 cost-effective and efficient meteorological information services for exchange of less-sensitive meteorological information in SWIM.	Follow-up: <input type="checkbox"/> Required from States
When: 9-Sep-22	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SWIM TF	
Decision CNS SG/26/07 (SWIM TF/06/05) – Revised SWIM TF Terms of Reference	
What: That, the revised SWIM TF Terms of Reference (ToR) as shown in Appendix E 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 align with the progress made since the SWIM TF/5 and outcomes of Action item 25-1 from CNS SG/25.	Follow-up: <input type="checkbox"/> Required from States
When: 09 September 2022	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SWIM TF	

List of Conclusions/Decisions adopted by CNS SG/26 on behalf of APANPIRG on Technical Matters

Conclusion CNS SG/26/09 - Update of Flight Inspection Guidance Material (FIGM)	
What: That, the Edition 3.0 of the Flight Inspection Guidance Material (FIGM) provided in Appendix F 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: 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: <input type="checkbox"/> Required from States
When: 9-Sep-22	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/26/10 (SURICG/7/1 (DAPs WG/5/1)): Mode S DAPs IGD 4.0	
What: The Mode S DAPs Implementation and Operation Guidance Document Edition 4.0 provided in Appendix G 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: The revised draft includes ADS-B DAPs and adds guidance on the measurement of 1030/1090 MHz usage.	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 9-Sep-22	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: -	

Conclusion CNS SG/26/12 (SURICG/7/4) - Revised ADS-B Implementation and Operations Guidance Document (AIGD)	
What: That, the revised ADS-B Implementation and Operations Guidance Document (AIGD) provided in Appendix I to the Report, which consolidated all change proposals during SURICG/7, be adopted as Version 15.0.	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 from SURICG/7	Follow-up: <input type="checkbox"/> Required from States
When: 9-Sep-22	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Subgroup <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SURICG	

Conclusion CNS SG/26/13 (ATMAS TF/3/1) - ATMAS IGD Edition 1.0	
What: The Air Traffic Management Automation System Implementation and Operations Guidance Document Edition 1.0 provided in Appendix J to this Report be adopted	Expected impact: <input type="checkbox"/> Political / Global

List of Conclusions/Decisions adopted by CNS SG/26 on behalf of APANPIRG on Technical Matters

		<input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: The revised draft has been added the DMAN function and reviewed/updated with inputs from various States	Follow-up:	<input type="checkbox"/> Required from States
When: 9-Sep-22	Status:	Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: ATMAS TF		

A List of Conclusions adopted by APANPIRG/33 Meeting related to CNS

Conclusion APANPIRG/33/6 (CNS SG/26/01 (ACSICG/09/01 (CRV OG/09/01))): Revised Amendment of the Management Service Agreement for CRV project (RAS14801)	
<p>What: Recognizing that ICAO Technical Cooperation Bureau satisfactorily completed all the defined work items in the initial Management Service Agreement (MSA) and Project Document of RAS14801, that the required payments were settled, and that in end 2016, all the requirements of both parties have been fully completed and closed on record, That,</p> <p>i) all Pioneer States are encouraged to counter-sign the Revised amended Pro Document provided in Appendix A to Agenda Item 3.4;</p> <p>ii) any Pioneer State not countersigning is entitled to get its share of the remaining fund balance back. and</p> <p>iii) a Pioneer State for which a direct CRV connection is not considered feasible in 2017 by the selected vendor is entitled to get its initial contribution in full</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: The initial scope of MSA was completed by ICAO TCB which allowed for a successful evaluation process and selection of a best and final offer; a majority of Pioneer States is willing to use the rest of their initial contribution to continue to support CRV implementation.</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>
<p>When: 24-Nov-22</p>	<p>Status: Adopted by PIRG</p>
<p>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:</p>	

Conclusion APANPIRG/33/7 (CNS SG/26/02 (ACSICG/09/02 (CRV OG/10/01))): Extension of CRV Contract for one year	
<p>What:</p> <p>a) Recognizing that as per current contract, all authorities shall join the CRV project and sign the relevant Service Contract(s) with PCCWG with the billing start date on or before 31 December 2022 to not impose additional charges by the service provider and based on the survey responses of 2022, many Member States are in process to join CRV which may not be completed by December 2022, it is recommended to extend current CRV contract for one year.</p> <p>b) If agreed to extend, as per amended CRV contract, all authorities shall join the CRV program and sign the relevant Service Contract(s) with PCCWG with the billing start date on or before 31 December 2023 to not impose additional charges by the service provider.</p> <p>c) After the extension, the CRV contract expiry date will be 31 December 2028.</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: Several ICAO Member States have requested to extend CRV contract due to COVID-19 pandemic in CRV</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>

A List of Conclusions adopted by APANPIRG/33 Meeting related to CNS

Implementation webinar held in 2021 and based on the response of the survey done in 2022, many Member States are in process to join CRV which may not be completed by December 2022.	
When: 24-Nov-22	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 type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

Decision APANPIRG/33/8 (CNS SG/26/05 (SWIM TF/06/03)): Harmonization of Timelines for SWIM-related Initiatives	
What: To feedback to the ICAO Air Navigation Commission Technical Panels for a need to harmonize the implementation timelines of SWIM-related initiatives.	Expected impact: <input checked="" type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: There exists different timelines for the implementation of SWIM-related initiatives identified by various ICAO ANC Technical Panels. This creates confusion within States on their corresponding implementation sequences and as to how these different timelines are to be met.	Follow-up: <input type="checkbox"/> Required from States
When: 24-Nov-22	Status: Adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input checked="" type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SWIM TF	

Conclusion APANPIRG/33/9 (CNS SG/26/06 (SWIM TF/06/02, SWIM TF/06/04)): The Asia-Pacific SWIM Implementation Timeframe and inclusion of the Asia/Pacific SWIM Implementation in the Asia/Pacific Seamless ANS Plan	
What: 1. To set the timeframe for the implementation of SWIM in the Asia-Pacific region to be between 2024 and 2030, with 2030 being the target timeline for implementation completion. 2. To include SWIM implementation in the next edition of the Asia/Pacific Seamless ANS Plan.	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: This is to set the concrete target implementation of the Asia-Pacific regional SWIM to assist States in harmonizing their implementation plans in order to achieve the seamless information exchange across the region in time for future operations, e.g. FF-ICE. Additionally, to ensure that SWIM, a key building block to achieve the vision outlined in ICAO Doc 9854 Global ATM Operational Concept (GATMOC), is captured in the Asia/Pacific Seamless ANS Plan,	Follow-up: <input checked="" type="checkbox"/> Required from States

A List of Conclusions adopted by APANPIRG/33 Meeting related to CNS

providing an overall framework for Asia/Pacific States to plan their implementations to meet the future performance requirements.	
When: 24-Nov-22	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 type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SWIM TF	

Conclusion APANPIRG/33/10 (CNS SG/26/08 (SRWG/6/2)): Planning Principle for Aeronautical Frequency Bands of 108-117.975 MHz, 960-1215 MHz and 117.975-137 MHz	
What: That, Doc 9718, Handbook on Radio Frequency Spectrum Requirements for Civil Aviation, Volume II, Second Edition – 2022, is adopted as the planning principle for aeronautical facilities and services operating in the aeronautical frequency bands of 108-117.975 MHz, 960- 1215 MHz and 117.975- 137 MHz in APAC.	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: To implement the updated ICAO provisions	Follow-up: <input type="checkbox"/> Required from States
When: 24-Nov-22	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 type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: -	

Conclusion APANPIRG/33/11 (CNS SG/26/11 (SURICG/7/3)): Revised Surveillance Strategy for the APAC Region	
What: That, the Revised Surveillance Strategy for the APAC Region provided in Appendix D to Agenda Item 3.4 be adopted.	Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To reflect the outcome of the latest development in surveillance technology.	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 24-Nov-22	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 type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SURICG	
