INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY EIGHTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/28)

Bangkok, Thailand, 11 – 14 September 2017

Agenda Item 3: Performance Framework for Regional air navigation planning and implementation

3.4 CNS

REPORT ON THE TWENTY FIRST MEETING OF CNS SUB-GROUP

(Presented by Chairman of CNS SG)

SUMMARY

This paper presents the report of the Twenty First Meeting of the CNS Sub-group (CNS SG/21) held at the ICAO Regional Office, Bangkok, Thailand, from 17 – 21 July 2017. The meeting is invited to review the report and adopt the draft Decisions and Conclusions formulated by the CNS Sub-group.

This paper relates to –

Strategic Objectives:

*A: **Safety** – Enhance global civil aviation safety*

*B: **Air Navigation Capacity and Efficiency**—Increase the capacity and improve the efficiency of the global aviation system*

*E:**Environmental Protection** — minimize the adverse environment effects of civil aviation activities.*

1. INTRODUCTION

1.1 The Twenty First Meeting of the CNS Sub-group was held from 17 to 21 July 2017. A workshop on Development and Certification procedures for CNS/ATM Systems was held in conjunction with the meeting on 17 July. The meeting was attended by 90 participants from 22 States/Administrations, CANSO, IATA, ICCAIA and IFALPA. A summary report of the meeting for consideration by APANPIRG/28 is provided in the **Attachment A** to this paper. Full report of the Sub-group was posted on the following webpage:
https://www.icao.int/APAC/Meetings/Pages/2017-CNS-SG21.aspx

2. DISCUSSION

2.1 The meeting considered 20 Working Papers, 28 Information Papers covering its 13 Agenda Items. 5 Presentations were discussed at the workshop. Three Ad Hoc working groups were established to develop common understandings and agreed materials on several issues including development and certification procedures, flight inspection and cyber security.

2.2 In accordance with APANPIRG Decision 26/65 that the Sub Groups were empowered to adopt Conclusions and Decisions on technical matters, the CNS SG/21 meeting adopted following 5 Conclusions:

Conclusion CNS SG/21-C1	-	Withdrawal of the GOLD (the legacy "Global Operational Data Link Document edition 2).
Conclusion CNS SG/21-C4	-	CRV common provisions and implementation of pilot Project
Conclusion CNS SG/21-C7	-	AIDC Implementation and Operation Guidance Document
Conclusion CNS SG/21-C14	-	Asia/Pacific ADS-B Problem Reporting Database (APRD)
Conclusion CNS SG/21-C15	-	Revised ADS-B Implementation and Operations Guidance Document (AIGD)

2.2.1 The contents of above Conclusions adopted by the CNS SG are provided in the **Attachment B** to this paper for easy reference. AIDC IGD developed by Asia Pacific AIDC Task Force and ADS-B Implementation and Operations Guidance Document (AIGD) version 10.0 updated by Surveillance Implementation Coordination Group have been posted on the ICAO APAC Website.

2.3 Based on the outcome of discussions on various Agenda Items, the meeting developed 9 Draft Conclusions and 1 Draft Decision for consideration by APANPIRG/28 Meeting. List of these outcomes are shown below:

Draft Conclusion CNS SG/21-DC2	-	Upgrade AMHS to support IWXXM traffic
Draft Decision CNS SG/21-DD3	-	Dissolution of CRV Task Force
Draft Conclusion CNS SG/21-DC5	-	Revised Strategy for Implementation of Communication systems to support Air Navigation Service
Draft Conclusion CNS SG/21-DC6	-	Amendment of the Management Service Agreement for CRV project (RAS14801)
Draft Conclusion CNS SG/21-DC8	-	Revised ANP Table CNS II APAC-1 – AIDC Implementation Plan
Draft Conclusion CNS SG/21-DC9	-	Coding of Asia-Pacific SBAS service provider IDs in the avionics
Draft Conclusion CNS SG/21-DC10	-	Establishment of National PBN stakeholders forums

Draft Conclusion CNS SG/21-DC11	-	Update of the Catalogue of Flight Validation and Inspection Service providers in Asia and Pacific Region
Draft Conclusion CNS SG/21-DC12	-	Revised Template for Promulgation of ADS-B Avionics Equipage Requirements
Draft Conclusion CNS SG/21-DC13	-	Regional Supplementary Procedures for ADS-B Operation

2.3.1 All Draft Conclusions and the Draft Decision are included in **Attachment A** to this paper for consideration by APANPIRG/28 Meeting.

2.4 For easy reference purpose, Appendices used in the CNS SG/21 Summary Report carry the same Appendices numbers as those in the full report of CNS SG/21 meeting.

2.5 The updated ATN/AMHS, AIDC and the ADS-B implementation status in the Asia and Pacific Regions are provided in the **Appendix A** and **Appendix H** to CNS SG/21 meeting report.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

i) review the summary report on the outcome of CNS SG/21 meeting provided in **Attachment A**;

ii) note the Conclusions adopted by CNS Sub-group provided in the **Attachment B**; and

iii) consider adoption of draft Conclusions and the draft Decision developed or endorsed by the CNS Sub-group in the **Attachment C**.

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Agenda Item 1: Election of Chair of the Sub-group and adoption of agenda

1.1 Proposed by Singapore, seconded by USA, Mr. Wu Chi Kwong (Richard), Assistant Director-General of Civil Aviation Department, Hong Kong China and Vice Chair of the Sub-group was unanimously elected as Chairman of the CNS Sub-group.

1.2 The tentative agenda was adopted by the meeting.

Agenda Item 2: Review outcomes of APANPIRG/27 meeting and other meetings Relevant to CNS Sub-group

Outcome of APANPIRG/27 Meetings on CNS Matters

2.1 The meeting reviewed actions taken by APANPIRG/27 on the 3 Decisions and 13 Conclusions formulated by the Twentieth Meeting of the CNS Sub-group (CNS SG/20). The meeting noted with satisfaction the actions taken and progress achieved by States and the Secretariat, with the latest status of the Conclusions/Decisions and outstanding Conclusions provided in **Attachment A** and **Attachment B** respectively to the working paper.

DGCA Conf/53 Outcome

2.2 The meeting reviewed the relevant 11 Action Items and noted that "**Cyber Security Measures**" unde Action Item 53/2 has now became a standing agenda item in the CNS SG.

2.3 Based on the recommendation of FIT-ASIA/6 and RASMAG/22, the CNS SG/21 endorsed Conclusion CNS SG/21-C1 for withdrawal of the legacy Global Operational Datalink Document (GOLD Version 2) from APAC website, noting the ICAO Doc 10037 has been published.

Agenda Item 3: Aeronautical Fixed Service (AFS)

Outcomes of the Fourth Meeting of the ACSICG/4, Secretariat

3.1 The Fourth Meeting of the Aeronautical Communication Services Implementation Co-ordination Group (ACSICG/4) of APANPIRG was held in Bangkok, Thailand, from 16 to 18 May 2017. The meeting was held back-to-back with the Second meeting of the Common Aeronautical Virtual Private Network Operations Group (CRV OG/2) on 15 May 2017.

3.2 The updates on ATN/AMHS implementation progress achieved by States/Administrations including their near term plan was consolidated in **Appendix A** to this paper.

3.3 The meeting noted the encouraging progress provided to ACSICG by New Zealand, Samoa, Tonga, Tuvalu, and Kiribati in 2017.

3.4 The meeting further noted that the Phase 2 of the WB PAIP VSAT Deployment project was planned to provide connectivity to two or three sites in Vanuatu. Vanuatu, Cooks and Niue tenders were scheduled for end 2017.

3.5 The meeting discussed that there should be an interconnection between PASNet and CRV to ensure the regional integration, and that small Pacific Islands not using PASNet would use CRV. A specific affordable package had been negotiated, consisting in an IPSec secured connection over a local internet access. In addition, a CRV VSAT solution with MIR/CIR would allow a guaranteed SLA, but at a higher cost.

3.6 The meeting noted that the Internet Protocol Suite (IPS) for Aeronautical Safety Services Roadmap Document being developed by AEEC IPS Subcommittee would be incorporated into the ICAO Doc. 9896 IPS Technical Manual through Communication Panel (CP) Working Group I, with a target date of 2020. The primary scope of the standard is for Air-to-Ground service utilizing IPS while supporting OSI protocols. The meeting also noted that the ground gateways would be employed to accommodate both IPS and legacy protocols.

3.7 The meeting noted that ACSICG accepted the arrangement proposed by France to establish an AFTN/AMHS alternate routing for AFS traffic to/from French Polynesia and New Caledonia. France was therefore requested to forward the request to the ICAO Regional Office and the States concerned for consideration and necessary action when the link between Noumea-Tontouta and Tahiti is implemented.

3.8 The meeting noted ACSICG's discussions about the requirement to support ICAO meteorological information exchange model (IWXXM) which would become a standard applicable from November 2020 by AMHS. Supporting guidance for the relevant Annex 3 provisions is provided in the *Manual on the Digital Exchange of Aeronautical Meteorological Information* (ICAO Doc 10003) – in its 1st edition dated 2014 – which states that the ICAO IWXXM provides such a logical data model for aeronautical meteorological information in support of international air navigation. A timeline of the development of ICAO provisions concerning the implementation of IWXXM for transfer of meteorological information may be viewed as follows:

1) 2016-2018: TAC is a Standard, IWXXM is a Recommended Practice for METAR/SPECI/Trend, TAF, VAA, TCA, SIGMET, AIRMET;

2) 2018: TAC is a Standard, IWXXM is a Recommended Practice for METAR/SPECI/Trend, TAF, VAA, TCA, SIGMET, AIRMET, Space Weather;

3) 2020: TAC is a Standard; IWXXM is a Standard for METAR/SPECI/Trend, TAF, VAA, TCA, SIGMET, AIRMET, and Space Weather.

3.9 In order to meet the minimum requirement for the exchange of IWXXM messages, the meeting urged States/Administrations to implement Extended AMHS or Basic ATS Message Handling Service plus File Transfer Body Parts sub-set of extended AMHS for Binary data exchange (FTBP) functional groups as defined in Doc 9880 Part IIB section 3.4.1. The implementation of AMHS Server and User Agent implementation should support the subset configuration II. Basic + FTBP defined in Table 3-7 of section 3.4.2 as minimum requirements. The enhanced capability of the existing AMHS should be completed by end of 2020. Accordingly, the meeting endorsed the following Draft Conclusion:

<table>
<tr><th colspan="3">Draft Conclusion CNS SG/21-DC2: Upgrade AMHS to support IWXXM traffic</th></tr>
<tr><td colspan="2">What:
That, In order to support the requirement to exchange MET information in IWXXM format, States/Administrations be urged to upgrade AMHS systems (AMHS server and User Agent) by November 2020 to either Extended AMHS or Basic ATS Message Handling Service plus File Transfer Body Parts sub-set of extended AMHS for Binary data exchange (FTBP) functional groups as defined in Doc9880 Part IIB section 3.4.1.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td colspan="3">Why: Need to support IWXXM format data by AMHS</td></tr>
<tr><td>When: 21 July 2017</td><td colspan="2">Status: Draft to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub-groups ☒ APAC States ☐ ICAO APAC RO ☐ IATA ☐ICAO HQ ☐Other:</td></tr>
</table>

3.10 The meeting further noted that for the APAC region, SITA had completed AMHS IOT and POT with Thailand in December 2016 and in March 2017 POT with Singapore. SITA would also contact Australia for setting up an additional gateway at Brisbane.

3.11 The CRV TF/6 meeting was held in Bangkok on 14 and 15 December 2016.The meeting noted the steps and outcomes of the CRV evaluation process of the different bids as follows:

- An evaluation committee had been formed for the final review of the CRV tender package. A Pre-evaluation Meeting of the Common Regional Virtual Private Network Task Force (CRV PS/1) of APANPIRG had been held in Singapore, 22-24 March 2016 and attended by 38 participants from 17 States/Administrations;
- The technical evaluation had then been updated during CRV PS/2 on 9 and 10 May 2016;
- On 7 June 2016 a webconference (CRV PS/3) was held to review the final draft of evaluation (both technical and commercial) and then sent to ICAO TCB for final check, along with the evaluation report, for approval by the ICAO Contracts Board; and
- the approval of the evaluation report by the ICAO Contracts Board for the CRV Project (reference RAS/14/801 - PR 21101272 – Sealed Tender 22501631) was notified to the ICAO APAC Regional Office on 28 November 2016.

3.12 The meeting further noted that the ICAO Regional Office sent an ICAO State letter to all States in APAC region in order to notify the CRV common provisions are available along with necessary instructions. The meeting further noted the deliverables of CRV Task Force:

- MSA/DOA delivered in 2015;
- Cost Benefit Analysis in 2015, with further iterations in 2016 and 2017;
- Users requirements (including performance and safety requirements) in 2015;
- Request For Information (benchmarking of market) in 2016;
- Sealed Tender in 2016;
- Implementation plan in 2016; and
- Setting up of CRV OG in 2016

3.13 As a result, the meeting endorsed the following Draft Decision:

<table>
<tr><td colspan="2">Draft Decision CNS SG/21-DD3: Dissolution of CRV Task Force</td></tr>
<tr><td>What:
Noting that the terms of reference b/ to d/ have been completed and that completion of a/ and e/ will be performed by CRV OG on the basis of mature CRV implementation plan, and CRV Operating Manual,

That, the CRV Task Force be dissolved.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td colspan="2">Why: the CRV TF terms of reference b/ to d/ have been completed and completion of a/ and e/ will be performed by CRV OG on the basis of mature CRV implementation plan, and CRV Operating Manual</td></tr>
<tr><td>When: December 2016</td><td>Status: To be adopted by PIRG</td></tr>
<tr><td colspan="2">Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☒ APANPIRG ☒ Other: MID States</td></tr>
</table>

CRV OG/1

3.14 The First Meeting of the Common Regional VPN Operations Group (CRV OG/1) of APANPIRG was held at ICAO premises, Bangkok, Thailand on 16 December 2016.

3.15 The meeting urged concerned States to deliver their CBA at CRV OG/3 in December 2017. Lastly the meeting noted the ongoing coordination between MID and APAC Region regarding CRV implementation, and specifically that ICAO Regional Office had updated through the MID Office the MAEP Board/3 meeting (16-18 January 2017) which discussed projects including CRV on the current status, costs, requirements, exact technical and contractual nature. Further formalization of the coordination mechanism between the two regions would then be undertaken.

CRV OG/2

3.16 The Second Meeting of the Common Regional VPN Operations Group (CRV OG/2) of APANPIRG was held on 15 May 2017.

3.17 The meeting reviewed the open issue with the Public Key Infrastructure (PKI). The need for a PKI to secure exchanges at the application level had been integrated in the CRV Terms of Reference of the procurement. The ICAO Information Management Panel also considered that SWIM should be handled as an application regarding security. The SWIM Task Force therefore agreed that the possibility to operate PKI through the CRV service provider would be further explored. The meeting noted the consensus of the SWIM TF that the requirements should be further discussed with PCCW Global, Ltd. (PCCW) to explore feasibility and cost as part of the engineering package.

3.18 The meeting further noted that USA, Australia, New Zealand and Fiji were developing the CRV proof-of-concept for pioneer implementation and would valid 10 engineering key points. These 10 key points were being finalized with PCCW in the technical specifications. The validation outcomes would in turn feedback the review of the engineering package to make sure the CRV design be robust enough and meeting the overall expected performance.

3.19 The meeting adopted Conclusion CNS SG/21-C4 urging States/Administrations to consider implementing CRV at their earliest convenience. USA, Australia, New Zealand and Fiji were also urged to implement CRV pilot implementation in coordination with ICAO Regional Office and provide a proof-of-concept on the engineering package by CRV OG/3.

3.20 The meeting further noted the updated CRV Implementation Table placed at **Appendix B** of the Report and appreciated the momentum existing regarding CRV implementation.

Strategy for Implementation of ATN and Communication Infrastructure

3.21 The meeting reviewed the draft of revised regional strategy for the implementation of ATN and Communication Infrastructure presented by Australia on behalf of Japan, New Zealand and USA. The current strategy was adopted by APANPIRG/21 in 2010. The strategy was updated based on the recent developments including those requirements contained in the global air navigation plan (GANP) including ASBU B1, regional ATM seamless plan, requirements to support digital FIXM, AIXM and IWXXM data, AIDC applications and emerging SWIM based applications. The revised strategy agreed by the meeting is placed at **Appendix C** to this Report. Accordingly, the meeting endorsed the following draft Conclusion:

Draft Conclusion CNS SG/21-DC5: Revised Strategy for Implementation of Communication systems to support Air Navigation Service	
What: That, the revised Strategy for implementation of Communication systems to support Air Navigation Service provided in **Appendix C** be adopted.	**Expected impact:** ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: The Strategy for implementation of Communication systems for APAC region was adopted by APANPIRG in 2010. The strategy requires to be updated based on the development.	
When: 21 July 2017	**Status:** Draft to be adopted by PIRG
Who: ☒Sub-groups ☒ APAC States ☐ ICAO APAC RO ☐ IATA ☐ICAO HQ ☐Other:	

Common Regional Virtual Private Network (CRV) Proposed Way Forward Regarding the MSA (RAS 14801), USA on behalf of Fiji, Hong Kong China, New Zealand, USA and the Secretariat

3.22 The eighteen CRV Pioneer States: Australia, China, Hong Kong China, Macao China, Fiji, France New Caledonia, India, Japan, Republic of Korea, Democratic People's Republic of Korea, Malaysia, Myanmar, New Zealand, Philippines, Singapore, Sri Lanka, Thailand, and USA, have contributed to ICAO Technical Cooperation Bureau (TCB) to represent all members to select a common service provider for telecommunication service in the region. A service provider has been selected and the fund contributed by the Pioneer States has a remaining balance and a decision was needed as the Management Service Agreement (MSA) clearly specified the fund can only be used for the procurement activities.

3.23 As a follow-up to Action 2-6 (CRV OG/3, USA/Hong Kong China/New Zealand/Secretariat): to propose a way forward regarding the MSA, taken at the CRV OG second meeting held on 15 May 2017 an ad-hoc meeting was held at the ICAO Regional office after the CRV OG meeting was conducted. The participants were from Fiji, Hong Kong China, Macau China, New Zealand, Singapore, and USA. The small working group studied the advantages and drawbacks of 4 scenarios and finally agreed to the following draft Conclusion, which was endorsed by the CNS SG:

Draft Conclusion CNS SG/21-DC6 : Amendment of the Management Service Agreement for CRV project (RAS14801)	
What: Recognizing that ICAO Technical Cooperation Bureau satisfactorily completed all the defined work items in the initial MSA and ProDoc 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, i) all Pioneer States are encouraged to counter-sign the amended Pro Document provided in attachment X; ii) any Pioneer State not countersigning is entitled to get its share of the remaining fund balance back; and 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.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
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.	Follow-up: ☒ Required from States
When: 3-Dec-17	Status: Draft to be

	adopted by PIRG
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: CRV Pioneer States	

Outcome of the First Meeting of System Wide Information Management Task Force (SWIM TF/1)

3.24 The Secretariat presented the report of First Meeting of the APAC SWIM Task Force (SWIM TF/1) which was held in Bangkok from 10 to 12 May 2017. The meeting was attended by 67 participants from 17 States/Administrations. The meeting noted the information on SWIM planning from 2017 to 2022, trials, demonstration and implementation presented by a number of States/Administrations at the Task Force meeting. The meeting also noted the robust program management approach and tasks assignment to task leads and members of the Task Force and the work plan agreed by the SWIM Task Force, including coordination mechanisms inside the region and with the concerned panels.

3.25 The meeting noted that the Task Force was established by the CNS SG (CNS SG/20 - D3) and its original report path is to the Sub-group through ACSICG. Considering the nature of Task Force work plan and the statements of work developed, the meeting recommended that the report of SWIM Task Force should be presented directly to CNS SG for consideration. This proposed change should be considered by the next meeting of the Task Force. In any case, a specific task of the SWIM Task Force has been designed to perform the horizontal coordination with all the TF/WG in the region which have a contribution to or a dependency on the SWIM implementation.

Report of Third Meeting of AP AIDC Task Force

3. 26 The meeting reviewed the report of the third meeting of the ATS Inter-facility Data Communication Task Force (APA TF/3) held in Makassar, Indonesia from 26 to 28 April 2017.

3.27 The third meeting of APA Working Group for AIDC Implementation and Operations Guidance Document (IGD) was held on 25th April 2017 in order to complete the draft document prior to the Task Force meeting.

3.28 The AIDC issues form was restructured to accommodate the identification of some fault categories as proposed by Indonesia such as: Communication Link, ATM Automation System, AIDC Message format, Airspace Design/Procedures and Other factors.

3.29 A summary of the analysis of the issues were tabulated for the 62 issues previously collected from Australia, India, Indonesia, Malaysia, Maldives and Singapore. States/Administrations were urged to report the AIDC implementation issues using the revised format to the ICAO Regional Office for updates.

3.30 The meeting noted the steps recommended for the identified issues that require software or firmware modification by the vendors to resolve the issue/s.

AIDC Implementation and Operations Guidance Document

3.31 The meeting noted that the AIDC Task Force meeting endorsed the AIDC Implementation Guidance Document (IGD Version 0.9) developed by the APA IGD working group through six meetings.

3.32 The meeting reviewed the AIDC Implementation and Operations Guidance Document and adopted the guidance material through Conclusion CNS SG/21-C7.

3.33 The meeting appreciated the efforts made by the AIDC Task Force, the working group and the contributions by the experts, task lead and participating States. It was a good example of collective efforts by States to complete the task. The meeting also noted that the APA IGD working group was dissolved as the task on the development of the AIDC IGD had been completed and the maintenance of the document can be done through AIDC Task Force and/or CNS Sub-group.

Updates on AIDC implementation activities

3.34 The meeting noted that updates on AIDC implementations including experience gained were provided by a number of States including China, Singapore, Indonesia, Thailand and the Philippines. The updated status of AIDC implementation in the Region is consolidated and provided in Appendix A to this Report. The significant implementation achievements reported are listed below:

- AIDC has been used for ATC transfer between Shanghai and Taibei since 2014;
- AIDC has been used between Guangzhou ACC and Taibei ACC since 2014;
- AIDC between Dalian ACC and Incheon ACC implemented since Nov. 2016;
- AIDC between Singapore ACC and Ho Chi Minh ACC implemented since July 2014 and Phase two with operational trial since 15 June 2015;
- Voiceless coordination between Brisbane and Ujung Pandang for northbound traffic commenced on 30 March 2017. AIDC between Brisbane and Ujung Pandang FIRs will be implemented by end of 2017;
- A plan in place for implementation of AIDC between Manila/Singapore and Manila /Ujung Pandang ACCs by 4Q2017;
- AIDC between Manila and Taibei ACCs will be implemented in 2Q2018; and
- AIDC between Chennai and Kuala Lumpur is being implemented in May 2017 with ABI, EST ACP MAC and (LAM and LRM) messages as first phase. Additional AIDC messages including CDN, TOC and AOC will be reviewed in August 2017.

3.35 The implementation issues and important lessons learnt are listed below:

- AFTN Latency issues (in abnormal condition such as via alternate routing) have been identified by China, India and Singapore. Possible solutions including parameters adjustment and use of dedicated lines instead of AFTN and through joining the CRV project.
- Invalid DEP and/or missing FPL messages; and
- Cyclic Redundancy Check (CRC) errors due to ATMS generating extra spaces.

Development implementation Plan focusing those connections identified with priorities by APANPIRG

3.36 The meeting recalled safety issues related to human errors during ATS transfer human errors which had been identified APANPIRG. Considering that ATS Inter-facility Data Communications (AIDC) is an important means of minimizing Large Height Deviations (LHD), the AIDC Task Force meeting updated the following implementation action plan for the significant LHD interface areas:

a) **Indonesia:** between Jakarta and Chennai/Ujung Pandang/Melbourne FIRs

– Jan. 2019 which is the revised target date for ATM system (with AIDC functionality) at Jakarta ACC.

Note: AIDC trials between Brisbane and Ujung Pandang ATSUs had been carried out for number of years. The implementation date will be in July 2017.

b) **India:** between Chennai and Kuala Lumpur FIRs;

– AIDC trial operations without voice confirmation were commenced from 25th February 2016. Currently both sides are working on the LOA approval. Chennai and Kuala Lumpur AIDC was implemented on 15 May 2017 with limited messages after India hosted tripartite meeting with Malaysia and Indonesia in April 2017.

c) **Philippines:** between Manila FIR and Fukuoka / Taibei /Hong Kong/Ho Chi Minh/Singapore/ Kota Kinabalu /Ujung Pandang FIRs;

- Fukuoka: Technical tests planned using the new ATM system in 4Q2017. (a target date of implementation will be confirmed by Japan);
- Taipei: 2Q2018;
- Hong Kong: Co-ordination for technical tests on the new ATM system is on-going. For technical tests in 4Q2017;
- Ho Chi Minh: For technical tests using the new ATM system in 2Q2018. Singapore: 4Q2017;
- Kota Kinabalu: Technical tests using new ATM system to be confirmed by Malaysia; and
- Ujung Pandang: target date of implementation in 4Q2017

Note: The Philippines is currently carrying out system upgrades to its existing system (Thales Topsky C) and a new ATM system replacement (Thales Topsky HE)

d) **China:** with Lahore and Ulaanbaatar FIRs

- Urumqi/Lahore FIRs: VSAT voice communication being established to replace IDD and the target date of implementation of the VSAT link is 4Q2017)
- Beijing/Ulaanbaatar FIRs, planned date of testing in 2017.
- Hong Kong/Guangzhou AIDC technical and interoperability tests were successfully completed in April and June 2017 respectively, while operational test is scheduled for end of 2017.

3.37 The meeting was reminded of the minimum a set of 5 AIDC messages that should be implemented in accordance with APANPIRG Conclusion. Some States are taking a phased approach for their implementation.

Review ANP Table CNS II APAC-1 – AIDC Implementation Plan

3.38 The meeting noted the regional Air Navigation Plan related information in particular the approval of Volume II of APAC ANP on 25 January 2017. The meeting further provided further updates to the information in the planning table for AIDC i.e. Table CNS II APAC-1-AIDC Implementation Plan. Accordingly the meeting endorsed the following Draft Conclusion:

<table>
<tr><td colspan="2">Draft Conclusion CNS SG/21-DC8: Revised ANP Table CNS II APAC-1 – AIDC Implementation Plan</td></tr>
<tr><td>What:
That, Revised Table CNS II APAC-1-AIDC Implementation Plan provided in Appendix E be amended in accordance with the established procedure.</td><td>Expected impact:
☐ Political / Global
☒Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td colspan="2">Why: The Table CNS II APAC-1-AIDC Implementation Plan was updated by the APAC AIDC Task Force and it should be approved through an amendment procedure (PfA).</td></tr>
<tr><td>When: 21 July 2017</td><td>Status: Draft to be adopted by PIRG</td></tr>
</table>

Draft Conclusion CNS SG/21-DC8: Revised ANP Table CNS II APAC-1 – AIDC Implementation Plan
Who: ☒ Sub-groups ☒APAC States ☐ ICAO APAC RO ☐ IATA ☐ICAO HQ ☐Other:

3.39 The meeting noted the remaining work of the Task Force and the terms of reference for the Task Force. The Task Force would continue till 2019 in order to provide assistance for the AIDC implementation between numerous ATSU pairs identified with priorities.

Agenda Item 4: Aeronautical Mobile Service (AMS)

Implementation of CPDLC in Continental Area

4.1 Japan reported data link communication in continental area under their future roadmap of Collaborative Action for Renovation of Air Traffic Systems (CARATS). Japan decided to introduce controller pilot data link communication in continental area (Continental CPDLC), which could be beneficial in respect of increase control processing capacity, improve safety, reduce of communication time and prevent human errors related to communication.

Necessity of New Performance Test for ATC Communication System and Related Proposal

4.2 Republic of Korea reported the new performance test for ATC communication system at Incheon International Airport (IIA) has been designing to overcome limitations and problems (such as fragmentary system) of the current performance test which measures individual equipment.

Anomalous Propagation of VOR/ILS LOC by Sporadic E Layer, Japan

4.3 Japan presented the measurement results of anomalous propagation of VOR and ILS LOC signals by the sporadic E (Es) layer around Japan. The paper showed that anomalous propagation could occur in a distance range of 600–2000km from the radio source and signal levels of anomalous propagation as undesired signal could be as high as a desired signal, which may cause interference to other VHF ground-based navigation aids and VHF communications.

SELCAL Survey

4.4 The Secretariat informed the meeting that a survey on the Selective Calling (SELCAL-32) system code was conducted by the Aviation Spectrum Resources Inc. (ASRI) which is responsible for administering SELCAL codes on behalf of ICAO. The SELCAL 32 proposal is now in final approval process by the ICAO Communications Panel (CP) for inclusion in ICAO's Standards and Recommended Practices (SARPs). More information on this can be found at www.asri.aero/SELCAL .

Agenda Item 5: Navigation

Outcomes of the PBNICG/4 meeting

5.1. The meeting reviewed the outcomes of the PBN Workshop 2017 and the fourth Meeting of the Performance Based Navigation Implementation Coordination Group (PBNICG/4) meeting held on 13 March 2017 and from 14 to 16 March 2017 respectively and necessary follow-up work to be conducted.

5.2. At PBNICG/4, India raised the issue that SBAS providers such as GAGAN,

BDSBAS and KASS were ready to provide services or preparing for providing services in the region, but that LPV implementation would be delayed as long as the appropriate coding of Asia-Pacific SBAS service provider IDs in the avionics, or an appropriate workaround, is not available in Navigation databases. In this regard, the meeting endorsed the following Draft Conclusion:

<table>
<tr><td colspan="3">Draft Conclusion CNS SG/21-DC9: Coding of Asia-Pacific SBAS service provider IDs in the avionics</td></tr>
<tr><td colspan="2">What:
That, ICAO, with the support of ICCAIA, be urged to:
a) coordinate the appropriate coding of Asia-Pacific SBAS service provider IDs in the avionics as early as possible through the implementation of ARINC Nav data specification (revision 21); and

b) advise about the advantages and disadvantages to use the SBAS service provider ID 15 currently available with revision 20 as a workaround pending the implementation of a)</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☒ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: LPV implementation will be delayed as long as the appropriate coding of Asia-Pacific SBAS service provider IDs in the avionics, or the workaround, is not available in Navigation databases</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 30 December 2017</td><td colspan="2">Status: Draft to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☒ICAO HQ ☒Other: Navigation system panel, PBN Study Group</td></tr>
</table>

5.3. The meeting reviewed a table showing challenges of PBN implementation, potential impact and proposed way forward and agreed the need on the establishment of a national PBN stakeholder's forum to deal with the challenges. Also recognizing the efficiency of a national PBN forum as implemented by some States/Administrations, the meeting endorsed to the following Draft Conclusion:

<table>
<tr><td colspan="2">Draft Conclusion CNS SG/21-DC10: Establishment of National PBN stakeholders forums</td></tr>
<tr><td>What: Noting that the insufficient articulation between the regulatory and implementation processes is a major cause for the slow implementation of PBN, a lack of efficiency and an increased risk in operations:
That, States be urged to establish a national PBN stakeholders forum (or a similar mechanism) to review and coordinate on an ongoing basis:

a/ the national PBN implementation and regulatory roadmaps, taking into account the global and regional objectives, the fleet readiness, the best equipped/best served principle, and the reduction of environmental impacts;
b/ the training policies and programmes for all stakeholders;
c/ the necessary changes to the legal and regulatory framework; and
d/ the expected and actual benefits of PBN implementation in terms of safety, efficiency, schedule reliability, CO2 emissions and noise exposure, airport accessibility, and reduced infrastructure costs.

The forum should include regulator, ANSP, aerodrome operators, Instrument Flight Procedure Design organizations, all airspace users, and as required communities impacted by noise exposure and carbon emission levels.

Note: the PBN implementation plan is an appropriate tool to support such a</td><td>Expected impact:
☒ Political / Global
☐ Inter-regional
☒ Economic
☒ Environmental
☒ Ops/Technical</td></tr>
</table>

national coordination; *IFSET is an appropriate tool to demonstrate the expected and actual benefits of PBN implementation*	
Why: The insufficient articulation between the regulatory and implementation processes is a major cause for the lack of PBN implementation, a lack of efficiency and an increased risk in operations	Follow-up: ☒Required from States
When: 16-Mar-18	Status: Draft to be adopted by PIRG
Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

5.4. Regarding the outcomes of the PBN Workshop 2017, the meeting was informed that States were recommended to start with a best equipped/best served policy and then mandate the necessary equipage if the uptake of operators was still insufficient, instead of mandate of GNSS and RNP 2 in the Doc 7030. The meeting also informed that a team composed of multidisciplinary experts including qualified pilot inspectors should be an efficient way to facilitate PBN operational approval together with documented approval procedures for applicant and a workshop for IFP surveillance would be held in conjunction with PBNICG/5 for educational purpose by APAC Regional Sub Office (RSO).

5.5. In relation to the change in chart identification for PBN approaches, the meeting was informed of ICAO Electronic Bulletin 2017/05 which contains following recommendations until new transition planning guidance material is available in summer 2017.

5.6. The meeting was informed that there was a proposal to conduct a survey to include required capabilities related to the flight validation of PBN procedures and reviewed a draft document which would be used for the survey and the update of the current Catalogue of Flight Inspection Units Asia and Pacific Regions published in October 2009. Recognizing the necessity of flight validation on PBN implementation, the meeting endorsed the following Draft Conclusion:

Draft Conclusion CNS SG/21-DC11: Update of the Catalogue of Flight Validation and Inspection Service providers in Asia and Pacific Region	
That, a/ States provide their flight validation and inspection unit's capabilities to reflect PBN procedure flight validation and flight inspection capabilities through an ICAO RSO's survey. b/ ICAO Asia and Pacific Regional Office update the Catalogue of Flight Inspection Units Asia and Pacific Regions based on the survey outcomes.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: To facilitate PBN Implementation through shortening the PBN flight validation period	Follow-up: ☒Required from States
When: 28 Feb 2018	Status: Draft to be adopted by PIRG
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: ICAO RSO	

Development Plan of the Beidu Satellite-based Augmentation System

5.7 China presented the development plan of the BeiDou Satellite-Based Augmentation System (BDSBAS). The BDSBAS space segment includes 3 Geostationary Earth Orbit (GEO) satellites which will be launched by 2020 and have two downlink frequencies, L1/B1C (1575.42 MHz) L5/B2a (1176.45MHz). The service level of BDSBAS will be APV-I in the first place and provide CAT-I performance later. BDSBAS will reach full operational capability by 2022 and provide service for aircraft that are equipped DO-229 (or equivalent) compliant equipment.

Need for Standardization of Certification for Determining Facility Status of Ground-based Radio Navigation Aids

5.8 Nepal presented the challenges being faced by Nepal in maintaining its ground-based radio navigation aids in accordance with ICAO SARPs, which requires periodic ground and flight tests. The paper highlighted the different formats of flight inspection report which were provided by flight inspection service providers who use their own regulations and the difficulties to get service period extension when the flight inspection for ground navigational aids could not be conducted in time. In this regard, the paper proposed a standardized format for the flight inspection certificate to be included in the SARPs to mitigate the problems raised. Sri Lanka supported the proposal of the Nepal.

5.9 The Chairman suggested and the meeting agreed to organize a small group discussion with Hong Kong China taking the lead among Singapore Japan, Nepal, and Sri Lanka to share experiences on flight inspection. During the small group discussion, it was noted that the same flight inspection service provider had used different formats for Nepal and Sri Lanka. The different formats of reports could have given rise to the concerns from Nepal. The meeting was reminded that according to the ICAO Doc 8071 “The responsibility for determining facility status rests with the appropriate States authority or the organization authorized by the State”, then shared their flight inspection reports and formats as well as highlighted that detailed measurements recorded in the flight inspection report should form the basis of flight inspection results, with equipment status concluded as Usable/Unrestricted, Usable/Restricted and Unusable. Sri Lanka and Nepal showed their appreciation to the meeting as more experiences and insights gained among different States/Administrations. The small group took note of particular remarks specified by flight inspection service providers in Nepal's flight inspection reports. States are encouraged to review the flight inspection reports together with flight check inspector, prior to their finalization, as there is no need to define the time bound or similar conditions since it is State’s responsibility.

Current Status and Plans for PBN Implementation in Pakistan

5.10 The paper explains that Pakistan had implemented RNP APCH procedures for 37 out of 40 runway ends, resulting overall 92.5% implementation. Also 8 out of 9 aerodromes listed in the ICAO APAC Regional Air Navigation Plan (APAC ANP) had RNP1 STAR procedures. For en-route implementation, Pakistan implemented RNAV5 and RNP 10 ATS routes to serve regional major traffic flows and was under study for RNP2 ATS route implementation with neighboring States in accordance with APAC Seamless ATM Plan.

Status of ISTF Technical Paper Publication

5.11. Japan presented the current status of publication of a technical paper presenting the APAC GBAS ionospheric threat model as outcomes of activities of Ionospheric Studies Task Force (ISTF). The paper will be published at “GPS Solution” with the title of “Ionospheric delay gradient model for GBAS in the Asia-Pacific region” in late 2017.

Further Analysis of Ionospheric Gradient for GBAS in Japan

5.12. Japan introduced a three-year program to analyze ionospheric data over Japan for GBAS by Electronic Navigation Research Institute (ENRI), which was launched from April 2017. The program consists of two major objectives, which are the development of a GBAS ionospheric threat model for the transition region between low and mid-latitude regions and further analysis of low latitude ionospheric delay gradients. The Secretariat encouraged States to share data gained through their own study and recommended to use ISTF portal which is still available in the ICAO Secure Portal to exchange experiences.

MSAS Status and Future Plan

5.13. Japan informed that MTSAT-2 will be decommissioned in 2020 and Quasi-Zenith Satellite System (QZSS) will start operations from 2018 with four (4) satellites consisting of one GEO and three QZOs (Quasi-zenith orbit satellites). QZSS will take over the function of MTSAT in 2020 (MSAS V2) and LPV service will be provided in 2023 (MSAS V3).

GBAS Implementation Status Update in Japan

5.14. Japan informed that GBAS implementation in Haneda airport started in 2016 and the installation of GBAS system which is in design phase by NEC Corporation will be completed by the end of March in 2019. The commencement of CAT-I operation is planned by the end of March in 2021 after the evaluation operation of the system. Regarding the ionospheric threat model, the common ionospheric threat model for GBAS in the APAC region is used together with the ionospheric environment over Haneda.

Australian-New Zealand SBAS Trial

5.15. Australia presented SBAS trial program which has been conducted by Australia and New Zealand. The meeting was informed that the objective of the program is to examine performance available to various industry sectors, including aviation, in an effort to establish a benefits analysis for the technology. The SBAS Testbed will include a L1 SBAS Service, a Precise-Point-Positioning (PPP) Service and the next generation Dual-Frequency Multi-constellation (DFMC) SBAS Service with the timeline of 1 June, 1 August and 1 October this year respectively and will continue its operation through to January 2019.

DFMC SBAS Testbed

5.16. ICCAIA provided information on DFMC SBAS characteristics, LPV 200 availability, and various advantages as well as SBAS system overview. The meeting was also informed of the SBAS Testbed scope of each participant, used dual frequency (1575.42 MHz, 1176.45 MHz) and constellation (GPS, Galileo) of the testbed, schedule for multimodal signal-in-space, SBAS Interoperability Working Group Interface Control Document (IWG ICD) and 9 areas of demonstration. At the end of the presentation, ICCAIA encouraged government and industry partners of other ICAO States to participate in SBAS testbed in the areas of formal coordination through provision of CORS data, sharing of testbed performance data and analysis, data collection and validation of SBAS signal reception, participation in a program of SBAS demonstrations, and rigorous benefits analysis to support future investment decision.

Agenda Item 6: Surveillance

The Second Meeting of the Surveillance Implementation Coordination Group

6.1 The meeting reviewed the outcome of the Second Meeting of the Surveillance Implementation Coordination Group (SURICG/2) and Surveillance Seminar held in Ulaanbaatar, Mongolia from 12 to 15 June 2017. The report of meeting and other relevant documents are provided on the following webpage: https://www.icao.int/APAC/Meetings/Pages/2017-SURICG2.aspx

6.2 The Twelfth Meeting of the South East Asia and Bay of Bengal Sub-Regional ADS-B Implementation Working Group (SEA/BOB ADS-B WG/12) was held in Guangzhou, China from 8 to 10 November 2016. The meeting report available on the following webpage was reviewed by the SURICG/2 meeting:
https://www.icao.int/APAC/Meetings/Pages/2016-SEA-BOB-ADS-B-WG12-.aspx

Review definition of ADS-B airspace in Seamless ATM Plan expectations

6.3 The meeting noted the need identified by the SURICG/2 meeting to amend the definition of ADS-B airspace and noted the performance expectations in the Seamless ATM Plan 2.6 (expected implementation 2015) and 2.25 (expected implementation 2019), and agreed to explore amending the definition of ADS-B airspace taking into account other surveillance technologies that may be equally or more suitable for certain airspace than ADS-B. States that are at present at 0% in the matrix can gain some percentage increase if they are using ADS-B for example for situational awareness but have no mandate. The meeting agreed to the suggested definition of ADS-B airspace based on the proposal made by SURICG and requested the Secretariat to take follow up action.

"% of FIRs where Category S and Category T airspace supporting high-density aerodromes are able to utilize ADS-B for situational awareness and/or separation."

Avionics Requirements Template amendment

6.4 SURICG/2 meeting proposed to revise APANPIRG Conclusion 26/42 adopted in September 2015 to reflect new development of standards and improvements. On 7 December 2015 the Federal Aviation Administration (FAA) had published the FAA Advisory Circular (AC) No. 20-165B, which superseded the FAA AC No. 20-165A. It also was noted that, while the FAA AC No. 20-165A was superseded, equipment previously pursuant to AC No. 20-165A was still valid for operations. The European Aviation Safety Agency (EASA) had issued Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance (CS-ACNS).

6.5 Update of the Requirements Template would ensure that the latest standards were supported, while continuing to allow certification against older standards. This was consistent with the Asia Pacific region supporting the use of DO-260, DO-260A and DO-260B (Version 0, 1 and 2) standards. Accordingly, the meeting endorsed the following Draft Conclusion:

Draft Conclusion CNS SG/21-DC12 : Revised Template for Promulgation of ADS-B Avionics Equipage Requirements	
What: That, 1. States intending to implement ADS-B based surveillance service for a defined airspace and having not published regulations be urged to promulgate mandating rules for ADS-B Avionics Equipage Requirements as soon as possible using the revised Template provided in **Appendix F** to the Report;	Expected impact: ☒ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental

2. States that have implemented ADS-B based surveillance services are also urged to update their ADS-B avionics equipage requirements to align with the template; *Note: States are urged to include at least the standards stated in the template. States may include other standards allowed by the State's regulations.* 3. The template adopted under Conclusion APANPIRG/26/42 be superseded by the revised template; 4. The relevant parts in the ADS-B Implementation and Operations Guidance Document (AIGD) be updated accordingly.	☒ OPS/Technical
Why: To update the reference documents in the Template adopted earlier by APANPIRG.	Follow-up: ☒ Required from States
When: 14-SEP-2017	Status: Draft to be adopted by APANPIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Amendments to Doc 7030 – ADS-B Provisions

6.6 SURICG/2 meeting endorsed Proposals for Amendment (PfAs) to the MID/ASIA and PAC sections of ICAO Doc 7030 – Regional Supplementary Procedures. The PfAs proposed by Australia provided updates to the requirements for ADS-B equipment standards, clarification of requirements about use of zero values for NACp, and also included a new sentence relating to ADS-B data quality thresholds. There were currently no requirements in PAC procedures for ADS-B; these were also proposed for a PfA for the PAC Region.

6.7 The draft PfAs as agreed by the meeting are provided in **Appendix G** to this Report. In view of the foregoing, the meeting endorsed the following Draft Conclusion:

Draft Conclusion CNS SG/21-DC13 Regional Supplementary Procedures for ADS-B Operation	
What: That: 1. the Proposal for Amendment (PfA) to the Regional Supplementary Procedure (SUPP Doc 7030) be processed in accordance with established procedure, based on information provided in **Appendix G** to the Report; and 2. ICAO be requested to coordinate the PfA as required, with the objective of achieving inter-regional alignment of requirements for operation of ADS-B.	Expected impact: ☐ Political / Global ☒ Inter-regional ☒ Economic ☐ Environmental ☒Ops/Technical
Why: Need to update relevant provisions in SUPPs based on the developments of the equipment standards and need to issue PfA for PAC region	Follow-up: ☒ Required from States
When: 14-SEP-2017	Status: Draft to be adopted by PIRG
Who: ☐Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ICAO HQ ☐Other:	

Updated status of Surveillance Activities and ADS-B Implementation

6.8 A number of States/Administrations including Australia, China, Hong Kong China, Fiji, Japan, Malaysia, Mongolia, New Zealand, Republic of Korea, and USA provided updated status

of ADS-B implementations. The updated information on ADS-B implementation plan and project is also consolidated into **Appendix H** to this Report.

Surveillance System Implementation and Planning in Mongolia

6.9 The meeting noted that the Civil Aviation Authority of Mongolia (CAAM) had confirmed a plan for implementing ADS-B technology and air navigation surveillance services in 2017. Currently, CAAM had installed 7 Mode S SSR and 13 ADS-B stations supporting DO-260 and 260A/B to cover the main en-route areas. CAAM planned to procure one more Mode S SSR and 5 more ADS-B Stations. All ADS-B stations were connected to the ATM automation system, and CAAM had been using ADS-B for situational awareness since 23 March 2016. CAAM was studying the use of ADS-B for separation in some high level airspace in 2018, prior to mandating ADS-B by 2022.

U.S. ADS-B Avionics Performance Report

6.10 The FAA has fielded a new reporting capability to assist operators in understanding their aircraft's ADS-B avionics performance relative to the requirements of the U.S. ADS-B mandate. The "User's Guide" for the ADS-B avionics performance report capability is available at the URL: https://adsbperformance.faa.gov/PAPRRequest.aspx

U.S. FAA Exemption 12555 Applicability and Process

6.11 Early-generation GPS receivers may experience brief periods where they do not meet the FAA's required performance for ADS-B Out. Exemption 12555 is a time-limited grant of exemption from the Navigation Integrity Category (NIC) and Navigation Accuracy Category for Position (NACp) requirements specified in Title 14 of the U.S. Code of Federal Regulations (CFR). Exemption 12555 is valid from January 1, 2020 through December 31, 2024 and is subject to certain conditions and limitations. The operator must notify the FAA of their intent to adopt the conditions and limitations of the exemption. Operators are encouraged to use the notification letter template at: http://www.faa.gov/nextgen/equipadsb/media/12555ExemptionLetterofNotificationTemplate.docx

6.12 As part of the exemption, the operator must create, maintain and update a GPS equipage plan for airplanes equipped with ADS-B Out (meeting the requirements of U.S. Title 14 CFR 91.225) and will meet the performance requirements of U.S. Title 14 CFR 91.227(c). The plan must be submitted to the FAA by August 1, 2018 and updated as needed, but at least annually thereafter.

Implementation of ADS-B Avionics Problem Reporting Database

6.13 The meeting noted that the development of the APAC ADS-B Avionics Problem Reporting Database (APRD) had completed with supports from Australia, Hong Kong China, Singapore, ICAO RO/RSO and ATMB, China. The fully functional APRD was launched on the 21 July 2017. The database is placed at ICAO APAC website in the restricted area with name: APAC ADS-B Avionics Problem Reporting Database. Accordingly, the meeting adopted Conclusion CNS SG/21-C14 urging States/Administrations to nominate focal points for APRD and make full use of the APRD for reporting issues/problems and sharing experience as well as follow-up actions through the APRD.

SEA/BOB ADS-B WG/12 Report

6.14 The meeting noted that the Report of the Twelfth Meeting of the South-East Asia/Bay of Bengal Sub-Regional ADS-B Implementation Working Group (SEA/BOB ADS-B WG/12,

November 2016 was reviewed by SURICG/2 meeting and outcome was consolidated in the meeting report of SURICG/2.

Collaboration in the South China Sea

6.15 The meeting noted the updates on the developments of ADS-B collaboration in the South China Sea. Under the collaboration between Singapore and Indonesia/Vietnam, surveillance and communications gaps on L642 and M771 were covered. This enabled separation to be progressively reduced from 50NM before Dec 2013 to 20NM in Nov 2016. Singapore was also working with Brunei, the Philippines and Vietnam to further cover surveillance and communications gaps in the Singapore FIR.

Space-Based ADS-B Update

6.16 Aireon is in the process of deploying 72 ADS-B receiver payloads, aboard IRIDIUM NEXT satellites in a Low Earth Orbit (LEO), to form the Airborne ADS-B receiver segment of a global Air Traffic Service (ATS) Surveillance system. The associated ground based infrastructure processes ADS-B data from Space prior to delivery to Air Navigation Service Providers (ANSP).

6.17 Analysis of data received from ADS-B transponders on dedicated test aircraft plus targets of opportunity from aircraft worldwide, and from a Ground Based Reference Transponder (GBRT) has shown performance which exceeds ADS-B performance requirements for surveillance as established by EUROCAE and RTCA. The current launch cycle will enable implementation of global Space Based ADS B Surveillance in the 3rd Quarter 2017.

Enhancing Aviation Safety through the Use of ADS-B

6.18 Due to well-known limitations in traditional radar technology, radar signals could be susceptible to terrain blockage, signal garbling/reflection, transponder busy in replying to interrogations etc., causing known aircraft display issues on radar screens including false targets, aircraft positions temporarily not displayed, and split targets, irrespective of brands of Air Traffic Management System (ATMS) being used. The meeting recognized ADS-B as one of the cost-effective means in overcoming such limitations and urged States/Administrations to adopt a phased approach for gradual implementation of ADS-B within their airspace after all relevant safety assessments and reviews are satisfactorily completed. The meeting agreed to incorporate the above into the AIGD.

Boeing 787 ADS-B Deficiency Update

6.19 In following up an Action Item transferred from ADS-B SITF/15, Australia, Singapore, USA and Boeing provided an update on extrapolation errors identified in Boeing 787 aircraft, and reported that the necessary software upgrade would be available for deployment to the in-service B787 fleet via no-cost Service Bulletin B787-81205-SB340036-00 by the end of June 2017. IATA & all States/Administrations were urged to inform their member or registered airlines of the updated information. The meeting agreed to include information in the AIGD.

The Necessity of Mode S 24 Bit Address Monitoring

6.20 The meeting noted the information on an activity of ICAO Aircraft Address management conducted by Japan including monitoring, tool functions and outcomes. The meeting agreed to develop guidance material on ICAO aircraft address for inclusion in the AIGD.

6.21 The meeting noted the consolidated updates to the ADS-B Implementation Operations and Guidance Document (AIGD) by the SURICG/2 meeting and adopted a Conclusion CNS SG/21-C15 on the revised ADS-B Implementation and Operations Guidance Document.

Use of Mode S DAPS Data - IAS and MACH

6.22 New Zealand presented an update on their continuing implementation of Mode S Downlinked Aircraft Parameters (DAPs) within the Air Traffic Management System (ATMS), and issues found during the implementation work.

6.23 Selected Flight Level (SFL) had already been implemented since May 2016, and had demonstrated its effectiveness in alerting ATC to a possible loss of separation. Indicated Airspeed (IAS) and MACH Speed (Mach) were being added to further enhance the ATMS.

The Performance of Mode S Radar and Data Analyses

6.24 Half of the more than 100 radars operated by China had Mode S capability. The site sample tests covered radar models from four vendors, and an analysis of overall aircraft transponder capability for elementary surveillance (ELS) and enhanced surveillance (EHS) replies. Based on a statistical analysis, 97% of flights operated in the airspace of China were equipped with a Mode S transponder.

Application of Mode S Radar Data in ATM Systems

6.25 Mode S data processing functions has been implemented in some ATC systems in China since 2013 to enhance capabilities which covered extra information display, tracking function, Select Altitude Mismatch Alert and correlation function. System track contributed by Mode S radar can display extra information to controllers in the way of Extended Label. ATC system also makes use of the Inertial Vertical Velocity in DAPS to realize optimized Cleared Flight Level (CFL) protection in STCA and MSAW analysis function. ATC system uses the select altitude data extracted from the Mode S DAPS to provide an optimized Cleared Level Adherence Monitoring (CLAM) alert for controllers.

Formation of a Mode S DAPS Working Group

6.26 The meeting noted that SURICG had made a Decision on the establishment of a Mode S DAPS Working Group to progress the subject and tasks relating to DAPS as specified in the TOR of SURICG. The TOR of SURICG includes the requirement to study and identify applicable Mode S radar applications in the Asia and Pacific Regions, considering inter alia the use of Enhanced Mode S data (DAPs). China, Hong Kong China, Japan, Malaysia, New Zealand, Republic of Korea, Singapore and Thailand agreed to join the Working Group with Rapporteurs from China and Singapore.

Regional SSR Mode S Interrogator Identifier Codes

6.27 The meeting noted the status of Mode S Interrogator Identifier (II) codes coordinated by and registered with the ICAO APAC Regional Office. States/Administrations were urged to review information of II codes provided in the ICAO portal site (RO-APAC group) under CNSDOCS, and coordinate with the ICAO Regional Office for registration of II codes before use, particularly at radar sites located close to the airspace of adjacent States, for registration of II codes.

Data Synchronization between ATC Automation Systems

6.28 China presented the application of operational data synchronization technology between main/standby ATC automation systems on the same site. The approach covers *Flight Data Exchange* standard publishing, software upgrade for dual system with similar HMIs, test/validation platform installation and unified output interface server implementation. With the operational data synchronization, the dual configured ATC automation systems will be able to share its situational data

in real time and change main/standby role smoothly, it significantly minimized the risk for controllers to restore their situational awareness in the event of unexpected system outage.

6.29 The paper did attract great interest from States. Clarifications were given to the queries raised. In view of the encouraging discussion made, States were encouraged to actively consider organizing a workshop for experience sharing on the overall planning, design, acceptance tests, HMI adaptation, etc.

Tier 2 operations in New Caledonia

6.30 France informed the meeting about implementation of ADS-B Tier 2 operations in New Caledonia. Three ADS-B ground stations are able to cover all TMA. An initial end-to-end safety case was produced considering AMC2024 certified aircraft in order to pave the way forward.

ATS surveillance coverage expansion in Kathmandu FIR (

6.31 Nepal informed the meeting of the implementation of MSSR-S (Terminal and En-route) project. Recently, Terminal and En-route MSSR-S installation have been completed. The commissioning flight inspection is scheduled to be completed by September 2017. The Terminal MSSR-S installed in TIA will provide service up to 50 NM for Approach Control and En-route MSSR-S installed in Bhattedanda will provide service up to 200 NM for Area Control.

Review implementation of Multilateration

6.32 Republic of Korea updated the meeting about the operation status and some issues of the new Multilateration (MLAT) at Incheon International Airport. The MLAT system eliminates a shaded area though the construction of the MLAT system. In addition, the automatic labelling function of departing aircraft, arriving aircraft, towing aircraft, and de-icing aircraft increases the efficiency of control of ground mobile aircraft and enhances the safety of moving areas.

ADS-B Implementation Status in Sri Lanka

6.33 Sri Lanka updated the meeting that the ADS-B system installed in April 2017 consists of five (05) ADS-B Receiving Stations at Pidurutalagala; Bandaranaike International Airport (BIA); Mattala Rajapaksa International Airport (MRIA); Kilinochchi and Suriyakanda. The system achieves Island wide coverage. Central Processing System is co-located with Area Control Centre (ACC) at Colombo Airport, Ratmalana [RMA]. ADS-B system was flight inspected in May 2017 where coverage, MSAWs, ATM system accuracy, SIDs and STARs were successfully verified.

Surveillance Update

6.34 Following 2 February 2017 ADS-B fitment mandate for Australian- and foreign-registered aircraft, more than 98% of flights conducted under the IFR are fitted with ADS-B avionics.

Airservices continues to improve ADS-B coverage with the planned installation of 6 ground stations within the next 18 months. Australia has almost complete coverage of the continent at FL200 and good coverage in regional areas at FL100. Airservices decommissioned the en-route Paraburdoo radar in mid-June 2017 and will use existing ADS-B coverage to provide air traffic services in the area. Two more radars will be decommissioned in the near future near Perth (Kalamunda) and on the central east coast (Mount Boyce).

Agenda Item 7: Aeronautical electromagnetic spectrum utilization

Regional Preparatory Group Meeting for ITU WRC-2019

7.1 Frequency spectrum is a finite and limited resource, managed by the ITU through its WRCs held every four years, approximately. It is essential that aviation requirements for radio frequency spectrum be strongly supported by all ICAO Member States in all international fora where spectrum allocations are addressed so as to ensure that aviation requirements for safety of life services are duly presented and understood.

7.2 In accordance with APANPIRG Conclusion 27/45, a Regional Preparatory Group Meeting for ITU World Radiocommunication Conference – 2019 (WRC19) was held in Bangkok from 27 to 28 March 2017. The meeting was organized in conjunction with the Fourth Meeting of the Fourth Working Group Meeting of the Frequency Spectrum Management Panel (FSMP-WG/4).

Introduction to Aviation Spectrum and ITU/WRC Process

7.3 The meeting reviewed the requirement of aeronautical spectrum management and processes of the ICAO position. The States/Administrations were urged to follow ICAO Assembly Resolution A38-6 to support ICAO position and preparations for WRCs. IATA on behalf of member airlines expressed support to ICAO position.

Preparation of WRC2019 - Review relevant agenda items

7.4 The important WRC-19 agenda items relevant to aviation identified and discussed at the meeting are as follows:

- Agenda Item 1.10- GADSS;
- 9.1.4 – Stations on –board sub-orbital vehicles;
- WRC-19 agenda items which may negatively affect spectrum access for aeronautical systems (1.7, 1.8, 1.9, 1.11, 1.12, 1.13, 1.14, 1.16, 9.1.3, 9.1.6)

Spectrum issues and challenges, not on the specific agenda for WRC-19

7.5 Frequency use for small Remotely Piloted Aircraft Systems (RPAS) and potential frequency bands for RPAS line of sight links; were explored. Current SARPs and radio regulatory issues around using the fixed satellite service (FSS) for the RPAS C2 link were discussed, and a potential solution co-using the 5 GHz (5030 – 5091 MHz) band for both line-of-sight (terrestrial) and beyond-line-of-sight (satellite) was introduced

APT Regional Preparatory Forum for WRC-19

7.6 The WRC-19 preparations being undertaken in the Asia-Pacific Telecommunity (APT) APT Preparatory Group (APG) were introduced. The second meeting of APT Preparatory Group (APG19-2) was being held in the same week of CNS SG in Bali, Indonesia from 17 to 21 July 2017. One of the objective of the meeting was to develop APT's Preliminary Views on WRC-19 Agenda Items based on result of Member's contribution and study results available at ITU-R Study Groups; and

Aeronautical Frequency Management in APAC

7.7 Current aeronautical frequency management provision and procedure adopted in APAC through Conclusion APANPIRG/26/47 – Strategic planning and tactical use of VHF frequencies in the APAC Region from 2015 onwards was reviewed. The meeting noted that transition

to a new global database for VHF communication bands coordination using the ICAO Frequency Finder tool was taken place since November 2016.

Approved ICAO position for ITU WRC-19

7.8 The ICAO Position on issues of critical concern to aviation which are on the agenda of the International Telecommunication Union (ITU) World Radiocommunication Conference (2019) (WRC-19) developed by the Frequency Spectrum Management Panel was approved by the Council at the eighth meeting of its 211th Session, held on 19 June 2017. The State Letter for distribution of the ICAO position was issued on 14 July 2017. The approved ICAO position was also submitted to APT APG19-2 meeting. The executive summary of ICAO position is provided in *Appendix A* and The ICAO position for ITU WRC-19 is provided in *Appendix B* to CNS SG/21-WP/09.

7.9 States were encouraged to update the list of focal points for WRC-2019 designated by States which is posted on ICAO APAC webpage.

Agenda Item 8: Review and updates on

Improvements to the Regional Air Navigation System: Progress Against Seamless ATM Plan Objectives, Secretariat

8.1 The meeting noted the progress of implementation by APAC States/Administrations of the objectives set forth in the Seamless ATM plan.

8.2 As the second cycle of the Seamless ATM planning is starting, this mobilization should be recorded in a national seamless plan, making a gap analysis between the current baseline of the national air navigation system and the projected objectives of phase 2 (Nov. 2019) and phase 3 (Nov. 2022).

8.3 The meeting therefore encouraged Champion States above the regional average completion of 56.5% for phase 1 to organize a regional workshop on Master plans/national Seamless ATM plans including diagnostics and action plans.

Paving Way for Interoperability of Air traffic management System, Hong Kong, China

8.4 Hong Kong China reported that in November 2016, the Hong Kong Civil Aviation Department commissioned their new Air Traffic Management System (ATMS) which has successfully demonstrated its performance in coping with the challenges of peak traffic demands during the holiday and adverse weather seasons. A risk-based approach was adopted throughout system development, testing/acceptance, system and operations transition, handling of teething issues with good lessons learned. Hong Kong China would pioneer forming an international Users' Group to share operational and technical experience, and map out the future system development roadmap. The meeting also encouraged those States/Administrations in a position to do so to organize a user's workshop or meeting to share their ATM system roadmaps, functionalities, and lessons learned.

Agenda Item 9: Review status of CNS deficiencies (APANPIRG Deficiency List)

Updated status of CNS deficiencies

9.1 The outcome of discussions by CNS SG/21 is consolidated into a separate working paper under Agenda Item 4.

Agenda Item 10: Human Factors and Air Traffic Safety Electronics Personnel (ATSEPs) related training – outcomes of the CBT Workshop for ATC/ATSEP

ICAO Competency Based Training Workshop for Air Traffic Controllers (ATCO) and Air Traffic Safety Electronics Personnel (ATSEP), Secretariat

10.1 The Secretariat presented the outcomes of the ICAO Competency-Based Training (CBT) Workshop for Air Traffic Controllers (ATCO) and Air Traffic Safety Electronics Personnel (ATSEP) which was held in Bangkok, Thailand from 19 to 21 June 2017, gathering a total of 72 participants from 15 States/Administrations.

10.2 The workshop was facilitated by 7 instructors from CANI (Air Navigation Services of the Czech Republic, FAA, IFATCA, IFATSEA, NATCA (National Air Traffic Controllers Association in USA) and NATS (Air Navigation Services, United Kingdom), as a follow-up to Conclusion APANPIRG/27/47: Workshop on competency-based training and assessment for the ATSEP made by APANPIRG in 2016.

10.3 The workshop organized in 2017 had the following objectives:

a) introduce the Competency - Based Training (CBT) concept for Air Traffic Controllers (ATCO) and Air Traffic Safety Electronics Personnel (ATSEP); and

b) provide guidance for its implementation and assessment as outlined in the fourth amendment to the ICAO Doc 9868 - Procedures for Air Navigation Services — Training (PANS-TRG), applicable in November 2016, and associated training manuals to be published later in 2016 as the Doc 10056 – Manual on Air Traffic Controller Competency-based Training and Assessment and ICAO Doc 10057 - Manual on Air Traffic Safety Electronics Personnel Competency-based Training and Assessment.

10.4 Key outcomes of the workshop are as follows:

1) It was noted that the PANS-TRG 4th amendment introducing the competency-based framework for ACTO and ATSEP is applicable since November 2016;

2) The manuals (Doc 10056 - Manual on Air Traffic Controller Competency-based Training and Assessment and Doc 10057 - Manual on Air Traffic Safety Electronics Personnel Competency-based Training and Assessment) provide guidance on how to identify the ATCO/ATSEP competencies, design the training and assessment for them to perform assigned duties in their specific environment at the required standard. Both manuals are available and published as unedited versions on the ICAO-NET;

3) The introduction of CBT for ATCO and ATSEP provides several benefits;

4) PANS-TRG and guidance materials to support implementation of CBT are well established by ICAO. Those materials outline key features of the CBT approach and describe how it is to be used by course developers, instructors and examiners;

5) The manuals also describe how appropriate authorities can establish an adapted competency model that is appropriate for their specific environment; and

6) The transition from current practices was discussed and should be managed as a gradual introduction of Competency Based Training.

10.5 Hong Kong China confirmed that while their implementation of a Competency-based Training for ATSEP had started based on ICAO Doc 9868 earlier than the issue of the Doc 10057 Manual, they were in the process to do a gap analysis with the Manual.

Competency of ATSEPs - China

10.6 Through the paper, China presented its practices to keep improving the competency of ATSEPs to meet the requirements in maintaining reliable and continuous CNS facilities operations with the introduction of comprehensive concepts in training processes.

10.7 China mentioned that the personnel certifying process is also restructured into 2 parts: 3 types of basic licenses for communication, navigation and surveillance respectively, 16 professional endorsements for different critical equipment or systems. The amendments and additional management rules helped the establishment of approved training institutions, lowered the cost and saved time significantly.

10.8 Besides, the Philippines explained the main principles of their competency-based training, and agreed to share their practice at the next CNS SG meeting.

Human Factors Influencing the ATSEP Job Performance and Means of Measuring the Safety Job Performance of ATSEP, India

10.9 India reported that to cope up with the expected traffic and safety levels, there is a need to find an effective way to measure the value of training given to ATSEP. This can be done through measuring the application of learning to job performance. India plans to assure the required level of safety, capacity and efficiency.

Identification of Scope of Activities Pertaining to Categories of ATSEP Sri Lanka

10.10 Sri Lanka explained that different staff levels of ATSEP are involved in the activities, which requires different levels of competencies to perform their assigned tasks. An example of possible categories of ATSEP was engineer, senior technician and technician. Therefore, Sri Lanka found that a guideline for identifying the categories of ATSEP in assigning the respective scopes of activities would be of help to ANSPs.

10.11 The meeting invited States, and in particular Philippines, to share experience on categories of ATSEPs for the next CNS SG meeting.

Agenda Item 11: Cybersecurity of CNS/ATM systems

11.1 The Secretariat made a presentation highlighting ICAO cybersecurity framework for civil aviation and its related activities. Some resources on the information security were also identified.

11.2 Assembly Resolution 39-19 has called on States and industry stakeholders to:

- encourage government/industry coordination with regard to aviation cybersecurity strategies, policies, and plans, as well as sharing of information to help identify critical vulnerabilities that need to be addressed; and

- Develop and participate in government/industry partnerships and mechanisms, nationally and internationally, for the systematic sharing of information on cyber threats, incidents, trends and mitigation efforts.

11.3 The ICAO framework consists of:

- ICAO Annex 17
- ICAO Aviation Security Manual, Doc 8973
- Global Risk Context Statement (RCS)
- ICAO ATM Security Manual, Doc 9985
- Civil Aviation Cybersecurity Action Plan

Effective Cyber Security Measures to achieve a safe, secured and efficient ATC System in Hong Kong China

11.4 Hong Kong China shared the meeting with their key elements of an effective cyber security management framework for a safe and secured ATC system as well as the latest status achieved by Hong Kong China in pursuing the ICAO's ATM Cyber Security Manual Doc 9985 published in 2013. Given the satisfactory assessments, Hong Kong China has met the Level 1 control requirements stated in ICAO Doc 9985 and successfully completed the transition to the new ATC system operations in November 2016.

11.5. The Chairman suggested and the meeting agreed to form a small group discussing the justifications and scope of formulating a Task Force or organizing a workshop. The small group consisted of India, Hong Kong China, Singapore and USA discussed and proposed no immediate need to form a Task Force and suggested to conduct a workshop with the following scope provided in the *Appendix K* to the report of CNS SG/21 meeting.

11.6 States/Administrations were urged to pursue appropriate level of compliance to the cyber security control requirements as stated in the ICAO Doc 9985 ATM Security Manual and make collaborative efforts to effectively address cyber security threats.

Cyber Security Models, Immediate Measures by ANSP for Protecting the critical information of CNS/ATM Systems

11.7 India highlighted that the Modern CNS/ATM systems and their complex network architectures changed considerably to meet the global air traffic growth and flexible requirement of stakeholders. When the CNS/ATM systems moved from closed network to more open network, new architecture brought not only the flexibility but also brought more threat to the critical information of CNS/ATM systems. The proposed immediate measures that can be done by any ANSPs include: protection on physical access to the information assets and network access to the information assets; well defined network users' responsibility; counter measures to configuration weakness of the network devices; counter measures to configuration weakness of the software and action during malfunctions. Some long term measures that can be taken up by the system developers were also suggested in the paper.

Cyber Security Threats to Information Exchange Models under SWIM Concept

11.8 Hong Kong China highlighted the potential cyber security threats related to defined information exchange models and raises awareness of the need to define security elements in Aeronautical Fixed Services (AFS). Before transition to SWIM, AMHS FTBP is used to support various Information Exchange Models, especially the IWXXM to be implemented in 2020. The information of IWXXM, AIXM and FIXM exchanged in X.400 FTBP format is making use of Extensible Markup Language (XML) to describe the information and data structure. However, the FTBP could pose threats to aggregator and recipients when being extracted for processing. Currently, there is no Commercial Off-The-Shelf (COTS) application available for scanning X.400 traffic. It

presents a challenge for reliable detection of cyber security threats because a compressed file might not indicate the presence of infected files because the threats are hidden within layers of the archive. Although, in most cases, we can ensure the messages with FTBP are received from a trusted source, the content of the FTBP may still carry malicious codes if the sender system is compromised. Chairman of ACSICG agreed to discuss this issue with respect to requirement for exchanging IWXXM data as a start.

Agenda Item 12: Certification, procurement procedures of CNS/ATM systems

Update on the CARATS

12.1 Through the paper, Japan presents the information about status update of the long-term vision for the future air traffic systems in Japan, namely "CARATS: Collaborative Actions for Renovation of Air Traffic Systems".

Need Collaboration for Implementation of the Air Navigation System

12.2 Japan shared the meeting of their view on challenges in promoting actions with regard to CARATS, the future vision on air navigation system in Japan, in order to promote modernization in line with GANP

Safety Regulation of the One Sky Australia Join Program

12.3 Australia presents the approach that Australia has taken to the safety regulation of the OneSky Australia Joint Program (OSAJP) – a joint effort between the civil and military air navigation service providers to procure and operate a common ATM platform for Australia: the Civil Military Air Traffic Management System (CMATS). Through the close collaboration of its military and civil service providers and regulators, Australia will be providing air traffic control services using the new system. This approach adopts the philosophy used in the type certification of aircraft and other systems, rather than a formal standards development and certification process as has been considered in other forums.

Outcome of Workshop on Development and Certification procedures for CNS/ATM systems

12.4 Under this agenda, the meeting also reviewed the outcome of the Workshop and two side meetings held on 17 and 19 July 2017 with the all stakeholders. The outcome of these meeting with further refinements and processes discussed at the workshop could be turned into guidance for the development and certification procedures for CNS/ATM systems and addressed the needs raised by Nepal and Republic of Korea. The outcome of the workshop and sides meeting is provided in *Appendix L* to the report of CNS SG/21 meeting.

Other Business

13.1 The meeting expressed appreciation to Mr. Lo Weng Kee for his dedication and contribution to the improvements and development of CNS facilities and services in the APAC Region as Chairman of CNS Sub-group of APANPIRG.

13.2 The meeting thanked Mr. Ian Mallett for his significant contributions over the years for development and implementation of PBN in APAC Region as Chairman of the PBNICG. The meeting also thanked the CRV Task Force Chair Mr. Chonlawit Banphawatthanarak and CRV Task Force participants for their achievements.

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ATN/AMHS/AIDC Implementation Status in the APAC Region

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
AFGHANISTAN					
AUSTRALIA	ATN tests were conducted. BIS Router and Backbone BIS Router and AMHS implemented. 64 kbps IPLC established with Fiji for basic AMHS will be migrated to CRV when successful CRV pilot project is completed. Connection with Singapore using AMHS was implemented October 2016; Another AMHS connections pending CRV pilot project (target date for December 2017) including both connection with New Zealand and USA. Plan to upgrade AMHS support IWXXM traffic from Nov. 2020.	COMSOFT	AFTN/AMHS based AIDC Implemented between Brisbane and Melbourne, Oakland, Nadi and Auckland; Implemented between Melbourne and Johannesburg; AIDC is also in use between Melbourne and Mauritius; Operational trial between Brisbane and Ujung Pandang since May 2013. Implementation in July 2017.		
BANGLADESH	In Q1/2013, Bangladesh installed ATN/AMHS and BIS Router at Dhaka (VGHS) with User Agents at Chittagong (VGEG) and Sylhet (VGSY).	COMSOFT	Tentative date of implementation of AIDC is Q4 of 2018 with Kolkata and Myanmar.		The Bangladesh ATM Upgrade Project (BATMUP) under Public Private Partnership (PPP) in Dhaka is expected to be completed by

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
					2018. As soon as the ATM up-gradation is completed hopefully Bangladesh will be able to implement AIDC with Kolkata and Myanmar by the end of 2018.
BHUTAN	IP Router and UA service planned for 2017. AMHS was installed in 1st half 2017.			Aerothai for AMHS and IP router	
BRUNEI DARUSSALAM	ATN BIS Router planned for 2015 and AMHS planned for 2015				
CAMBODIA	BIS Router and AMHS installed. Cambodia (CATS) AMHS connected with Bangkok via VSAT IP link since 10 December 2013	AVITECH	AIDC function and capability made available. Ready for testing with neighbors ATS Facilities starting from 2017 and target date of implementation with Bangkok in 2018	THALES which supports AIDC ICD Version 1.	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
CHINA	ATN Router and AMHS including NCC deployed in 2008 which is being upgraded to support ATN/IPS with target date of completion in December 2013. Tripartite BBIS trial completed with Bangkok and Hong Kong, China in Jan. 2003. ATN trial with Hong Kong using XOT over internet conducted in 2006, Further trials conducted in 2009. Plan for ATN/AMHS implementation with Hong Kong, China (2017). AMHS/ATN technical tests with Macau completed in 2009. Plan for ATN/AMHS implementation with Macau, China (2018). ATN/AMHS circuit with ROK put into operational use since June 2011. ATN/AMHS tests with India has been put into operation since 2016. ATN and AMHS technical trial with Mongolia is TBD. Interoperability test with Thailand is completed over internet. Connection tests with Nepal is TBD	IN-HOUSE (Aero-Info Technologies Co., Ltd)	AIDC between some of ACCs within China has been implemented. AIDC between several other ACCs are being implemented. AIDC between Sanya and Hong Kong put in to operational use since 8 Feb 2007. AIDC between Dalian and Incheon implemented in Nov. 2016; Guangzhou with Nanning/Zhanjiang/Zhuhai implemented; Nanning and Kunming/Guiyang/Zhanjiang implemented in 2011; Zhanjiang/Haikou; Chengdu and Chongqing/Guiyang implemented in 2011; Guiyang and Chongqing/Kunming implemented in 2011; For Beijing/Ulaanbaatar, planned date of testing in 2017.		

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
HONG KONG, CHINA	Hong Kong China had completed the Interoperability Test (IOT) with Beijing successfully in April 2016. The leased line between Beijing and Hong Kong has also put in place in June 2017. Hong Kong is now coordinating with Beijing for another round of IOT and Pre-operational Test (POT) through the leased line. The planned implementation date of Beijing-Hong Kong AMHS link would be by the end of 2017. ATN/AMHS circuit with Bangkok put into operation use in Sept 2014. ATN/AMHS interoperability tests with other adjacent communications centres commenced in late 2009, viz Taibei (2009), Japan (Planned Q2/2018 after implementation of CRV), Philippines (Planned Q1/2018 after CRV) and Viet Nam (Planned 2018).	COMSOFT	AFTN-based AIDC with Sanya put into operational use in Feb 2007AIDC technical trial with Taibei conducted in 2010 and completed in 2012 and put into operational use in Nov. 2012 AIDC technical and interoperability tests with Guangzhou conducted successfully in April and June 2017 respectively. AIDC tests with Manila is under coordination and targeted in Q4 2017.	Raytheon ATM system Support AIDC ICD Version 3 commissioned in November 2016.	Already support exchange of IWXXM messages based on FTBP
MACAO, CHINA	ATN/AMHS interoperability test with Beijing commenced in March 2009. ATN/AMHS circuit with Hong Kong put into operational use in end Dec. 2009. ATN/AMHS implementation with mainland China planned for 2018	COMSOFT	(Not applicable for using AIDC, looking into the possible application (some way) between TWR and ACC/APP).		

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
COOK ISLANDS					
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	The ATN BIS Router and AMHS planned for in 2011.		With neighboring ACCs to be implemented		
FIJI ISLANDS	ATN BIS Router and AMHS implemented Connection with USA and Australia has been implemented to support basic AMHS traffic. Plan to upgrade these connections using CRV and IP after the implementation of CRV pilot project. For connections with sub-regional centres: For New Caledonia using AMHS in 2017; For connection with Kiribati using UA/AMHS implemented in 2015.	COMSOFT	AFTN based AIDC implemented between Nadi/ Brisbane, Auckland and Oakland.	- Support and implemented AIDC messaging: ABI, EST, CPL, CDN, ACP, TOC, AOC with all three centers - AIDC ICD version 2.0 implemented with Auckland and Oakland. - AIDC ICD Version 1.0 implemented with Brisbane	
FRANCE ***(French Polynesia Tahiti)***	Planned for implementation of AMHS in 2020. Planned for using IP to replace X.25 with New Zealand shortly.		Implementation of AIDC (based on Version 3) with adjacent centres (Oakland and Auckland) since 2009	THALES EUROCAT for AIDC	Alternate routing for backup between Tahitti and Christchurch via Tahitti/New Caledonia IP link

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
INDIA	Dual stack ATN/IP router and AMHS implemented at Mumbai in 2011. Operational AMHS connections with Bangkok, Dhaka, Singapore, Kathmandu, Karachi implemented. With Beijing implemented in 2016; With Colombo planned for May 2017; With Bhutan and Nairobi planned for 2017.	COMSOFT	-AIDC planned with Bangladesh, Myanmar, Pakistan, Nepal, Seychelles, Malaysia, Indonesia, Sri Lanka, Oman and Maldives and Mauritius. -15-May-2017, AIDC implemented between Chennai and Kuala Lumpur with ABI and EST messages. CDN is done with voice confirmation. TOC/AOC to be implemented -Chennai-Colombo in testing phase; - Chennai-Male to be implemented by 15 Aug.17.	1) Raytheon at New Delhi, Mumbai and Chennai 2) Selex at Hyderabad and Bengaluru. 3) INDRA at 39 locations	1) Major Indian airports and ATC centres have integrated ATS Automation Systems having AIDC capability. Successful AIDC trials have been carried out amongst major ATSUs within India. 2) AIDC implemented between Chennai and Mumbai. 3) AMHS implemented and working between A. BBIS: Mumbai-Singapore, Bangkok B: BIS: Mumbai, Kathmandu, Dhaka
INDONESIA	AMHS implementation with Brisbane waiting for direct link BNE – UPG will be finished 2Q2017 For successful testing conducted between UPG and BNE; ATN BIS Router and AMHS trial (POT) with Singapore conducted in March 2017;	ELSA	Implementation Jakarta (new ATM system in 4Q in 2018) The target date of AIDC implementation will commence in 2019 including following pairs. Jakarta-Singapore (testing in 1Q 2019); Jakarta-Chennai; Jakarta-Ujung Pandang; Jakarta-Melbourne;		

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			Jakarta – Kuala Lumpur Ujung Pandang -Brisbane; plan for implementation with Brisbane in July 2017. Ujung Pandang – Manila; - Successful testing conducted ; - Target date of implementation in 4Q2017. Ujung Pandang - Kota Kinabalu - Testing conducted; - Implementation date TBC -	Thales in Makassar able to support ICD Version 3 since December 2015	Between PNG – Ujung Pandang, the implementation are waiting for PNG's ATM system upgraded. Between Oakland – Ujung Pandang is not planned yet, due to traffic volume consideration (very low).
JAPAN	ATN BBIS router and AMHS installed at 2000. Connection tests with USA 2000 - 2004 and put into operational use in 2005. ATN BBIS router (to apply to Dual Stack) and AMHS (to upgrade in 2015. The connection test with each country which is not currently connecting is started after update. Upgrading connection with Hong Kong using VPN will be implemented in 2018 after implementation of CRV; Coordinating for all other circuits upgrading.	NEC	AIDC implemented between Fukuoka ATMC and Oakland ARTCC in 1998. AIDC implemented between Fukuoka ATMC and Anchorage ARTCC in 2005. AIDC implemented between Tokyo ACC/Fukuoka ACC and Incheon ACC in 2010. Implemented between Fukuoka and Incheon since June 2009. AIDC implemented between Fukuoka ACC/Naha ACC		Japan and USA conducting testing AIDC over AMHS and cutover date is 5 May 2017.

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			and Taibei ACC implemented. AIDC between Fukuoka ACC and Shanghai ACC under negotiation.		
KIRIBATI	Connection with Nadi using UA/AMHS implemented in 2015.				
LAO PDR	ATN BIS Router and AMHS completed, planned for operation with Bangkok since 4Q 2016.	THALES	AIDC testing with Bangkok since late 2016. Testing with Hanoi planned for 2017, with Ho Chi Minh2017; with Cambodia for 2017	THALES which is able to support ICD Version 2.	
MALAYSIA	ATN BIS Router completed 2007. AMHS implementation planned for Q42017;	FREQUENTIS	AIDC testing with Bangkok ACC conducted since 2016. Operational trial will commence 4Q 2017. AIDC between Kuching and KK ACC already implemented since 2014 using OLDI. Between Kuala Lumpur/ Chennai implemented in phases from May 2017 implementation for ABI, EST and MAC along with response messages LAM,	SELEX which is able to support ICD Version 3.	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			LRM and ACP. Review on the CDN message implementation to be conducted in Aug. 2017. AIDC testing with Singapore on going since 2016. Target date for operational trial from 4Q2017. Planned testing with Ho Chi Minh ACC – 4Q2017; AIDC KK ACC and Philippines and Ujung Pandang planned for 4Q2017; AIDC for Kuching ACC with Singapore planned in 4Q2017.		
MALDIVES	Planned for 2016 as existing AFTN was upgraded recently to make it compatible with protocols of interconnected AMHS systems and the flight plan format 12.		System is AIDC ready. Implementation with ACC's (Planned testing with Chennai in 4Q2017; Planned testing with Mumbai in 4Q2017; with Colombo, Melbourne and Mauritius plan for 2017)	SELEX which is able to support ICD Version 3.	
MARSHALL ISLANDS					

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
MICRONESIA (EDERATED STATES OF)					
Chuuk					
Kosrae					
Pohnpei					
Yap					
MONGOLIA	AMHS/AFTN gateway implemented 2012. ATNBIS router implemented in 2014. Coordinating with China using ATN/AMHS connection technical trials conducted in 2014.	COMSOFT	ATM automation system supports both AIDC and OLDI. Coordinating with Russia on OLDI connection in target date 2016. Coordinating with China on AIDC connection between Beijing/Ulaanbaatar technical trial in progress. Planned date of testing in 2017.	INDRA Aircon 2100 supporting AIDC ICD Version 2.	
MYANMAR	AMHS including ATFN/AMHS gateway implemented in Nov. 2011; Connection with Thailand implemented in 4Q2016; Planned for AMHS connection with Beijing. Target date TBC.	THALES	AIDC connection test with Thailand conducted in late 2016; AIDC testing with Kunming in April 2017; Planned for AIDC connection with India.	THALES Automation system upgraded to Thales Topsky ATC system in January 2017 which supports AIDC Ver. 2 and AMHS connections	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
NAURU					
NEPAL	BIS Router and AMHS commissioned with Kathmandu Mumbai circuit on 2 June 2014.	COMSOFT	AIDC between Kathmandu and Beijing and planned testing between KTM-BBN and KTM-CCU for 3Q2018		
NEW CALEDONIA	New router and AMHS commissioned December 2016	COMSOFT			
NEW ZEALAND	IP based AMHS connections with USA June 2016 and plan to upgrade the connections using CRV and IP after the implementation of CRV pilot project.	COMSOFT	AIDC implemented between New Zealand, Australia, Fiji, Tahiti, Chile and USA.	Supported the Basic 5 message set. ATM systems are LEIDOS and ADACEL	
PAKISTAN	ATN/AMHS connections with Mumbai since 2015. Planning for AMHS connection with Beijing and Kuwait after upgrading existing facilities between the Countries. Target dates for implementation TBC.	COMSOFT	Implemented between Karachi and Lahore ACCs Testing between Delhi and Karachi and AHM and Karachi conducted since 2014. Planned testing between Mumbai and Karachi for 2018 and For Lahore/Delhi on-going testing since 2014. For Muscat planned for 2018.	ATM system from Intra AIRCON 2100	Existing Radar system being upgraded.
PAPUA NEW GUINEA	Plans to create a newly duplicated digital communications line connecting with existing and new sites and AMHS system implemented in 4Q2014	COMSOFT	Plan to implement with all neighboring FIRs in 3Q 2018. Negotiation with Indonesia for AIDC with Ujung Pandang in May	COMSOFT which is able to support ICD Version 3	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			2017.		
PHILIPPINES	New ATN/AMHS was installed at the New CNS/ATM Center in Manila. Site Acceptance was successfully done on October 2015. Transition from AFTN to AMHS using the new AMHS is planned in the 4thQuarter of 2017. The AMHS Interoperability test with Hong Kong is planned in Q1/2018. For Singapore 1st Quarter 1Q/2018. AMHS interoperability test with Oakland USA is planned for 4Q2018.	COMSOFT	Technical Trials on the interim system: On-going with Singapore, Ujung Pandang and Taipei ACCs; Planned technical trial over new ATM system with other ACCs from 4Q2017 to 4Q2018: Planned implementation with interim system: 4Q2017 – Singapore ACC; 4Q2017 – Ujung Pandang ACC; 2Q2018 – Taipei ACC;	THALES which is able to support ICD Version 2.	
REPUBLIC OF KOREA	ATN/AMHS circuit with China put into operational use in June 2011.	SAMSUNG	AIDC implemented between ACC and Fukuoka ATMC. AIDC between Incheon and Dalian implemented in Nov. 2016.	Rockheed Martin System	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
SINGAPORE	AMHS implemented. ATN/AMHS circuit with India put into operational use in March 2011. ATN/AMHS circuit with UK put into operational use in March 2012. ATN/AMHS circuit with Thailand put into operational use in December 2014. On-going ATN/AMHS trial with Indonesia and Malaysia. With Australia implemented in Oct. 2016.	COMSOFT	Operational with Ho Chi Minh implemented July 2014. Planned operational trial with Kuala Lumpur ATCC in 4Q2017. Technical trials with Manila ACC ongoing since Dec. 2014. Revised planned operational implementation by 4Q 2017. Technical trials with Jakarta ACC will be initiated once the Jakarta ACC ATMS renewal is completed.	THALES currently support ICD Version 1 and to be upgraded to Version 3 in 4Q 2017.	
SRI LANKA	ATN BIS Router Planned for 2013. IP based AMHS implemented by Oct. 2017. - Mumbai tested May 2017 operational planned for Q4 2017; - Singapore testing in Q4 2017 operational for 2018; - Male testing and operational date TBD.	IDS	Trials with Male' planned for in 2017. Trial with Chennai on-going. Plan for implementation in 4Q2017 and with Melbourne plan for 4Q2017 and implementation for 1Q2018.	INTELCAN which is able to support ICD Version 3.	
THAILAND	BBIS/BIS Routers already implemented. AMHS has been implemented since July 2011. Connection with Cambodia, India, Singapore, Hong Kong China implemented. Pre-operational test (POT) with Bangladesh, Lao	AEROTHAI's AMHS System and UBITECH System	AIDC Connection test with Lao PDR, Cambodia, Myanmar and Malaysia underway since 2016. Planned for operation trial with these States from late	THALES which is being implemented with planned completion in Early 2017. AIDC feature supports APAC AIDC ICD V.3.	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	PDR, Malaysia, Myanmar and Bhutan completed, implementation planned for end of 2017. Interoperability Test (IOT) with Beijing, China completed, pre-operational test planned for end of 2017. Interoperability Test; with Italy and Vietnam planned for end of 2017.		2017 to early 2018. Target date of implementation is around mid. 2018.		
TONGA	AMHS planned for 2008. The provider is linked to the New Zealand AFTN				CPDLC and ADS-C is not considered for lower airspace
UNITED STATES	AMHS implemented. (Salt Lake City & Atlanta). Transition using AMHS when counter parts ready Planned for AMHS implementation with Philippines 4Q2018	IN-HOUSE	AFTN based AIDC implemented. Planned for AIDC implementation with Philippines 4Q2018	IN-HOUSE which is able to support APAC and NAT ICDs currently Version 2.	
VANUATU					
VIET NAM	AMHS (basic) implemented. Trial phase from Q4/2015 to Q3/2017 IOT with Thailand in progress from Q4/2017 Plan to use AMHS in Q4/2017; Planned for IOT with Hong Kong and Singapore in 2017 For IOT with Laos PDR. TBC.	IN-HOUSE	Operational with Singapore since April 2014. Trial with Singapore for additional messages sets in 2016. Negotiating for implementation with Philippines in June 2017; Technical testing with Cambodia already done; Plan for trials with Lao.	Support ICD Version 1.0 with THALES at Ho Chi Minh ATM system. Support ICD Version 3.0 with Selex at Hanoi ATM System.	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			PDR in 2016 and with Malaysia to be confirmed. Testing with Cambodia on – going; For operation trial TBC.		
Wallis and Futuna (FRANCE)	AMHS implementation planned for end of 2017			COMSOFT	

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CRV Implementation Table – 15/05/2017

State/ Administration	Intended date for CRV cut-over	Applications targeted	Envisaged SLA (peers)	Migration scheme	Prerequisites/ dependencies
Australia	Dec. 2017	AFTN, ADS-B, AMHS, voice		staged approach	Termination of current COM contract
Cambodia	As early as convenient				Internal decision making
China	To be confirmed	Data (AFTN, AMHS) then voice		staged approach	
Democratic People's Republic of Korea	To be confirmed				
Hong Kong, China	To be confirmed	To be confirmed		To be confirmed	Our joining of CRV will be subject to the local CBA. A number of factors would need to be considered in formulating the implementation plan, including safety assessment for migration, end dates / termination of existing contracts, and coordination with relevant CAAs/ANSPs in joining CRV in a harmonized manner,etc.
Macao, China	To be confirmed				CBA migration from X25 to IP
Fiji	Dec. 2017	ADS-B, AMHS, voice	USA New Zealand Australia		CBA is now confirmed OK

State/ Administration	Intended date for CRV cut-over	Applications targeted	Envisaged SLA (peers)	Migration scheme	Prerequisites/ dependencies
France (New Caledonia and French Polynesia)	As soon as CRV is available				CBA, cost must be affordable *Wallis and Futuna: no dedicated connection to CRV*
India	As soon as CRV is available	BBIS first, then BIS States		staged approach	CBA, safety case
Indonesia	As early as convenient	AFTN, AMHS, ADS-B and voice			CBA
Japan	As soon as CRV is available	Data first		staged approach	
Malaysia	2019	AFTN, AMHS, ADS-B and voice		staged approach	Leased line contract until 2018 New ATC center in 2020
Myanmar	As early as convenient	AFTN, AMHS, ADS-B and voice			CBA
New Zealand	Dec. 2017	AFTN, AMHS, ADS-B and voice			CBA attractive if all counterparts join in
Philippines	Around 2018	1- AMHS and 2- voice-		staged approach	New ATM center in 2017 and migration of telecom local service provider
Republic of Korea	As soon as CRV is available	1/ AFTN/AMHS 2/ AIDC		staged approach	as soon as CRV pilot project has delivered outcomes
Singapore	As soon as CRV is available	1/ AFTN/AMHS 2/ Voice/AIDC/ADS-B		staged approach	CBA attractive if all counterparts join in

State/ Administration	Intended date for CRV cut-over	Applications targeted	Envisaged SLA (peers)	Migration scheme	Prerequisites/ dependencies
Sri Lanka	As soon as CRV is available	AMHS connectivity with Mumbai, Singapore and Male. Direct Speech facilities with Chennai, Trivendrum, Mumbai, Male, Jakarta, Melbourne, Singapore		Phased approach with the implementation of CRV	CBA
Thailand	As soon as CRV is available	Data first Then voice, subject to safety case		Staged approach	CBA attractive if all counterparts join in, safety case
United States	Dec. 2017	1/ AFTN to AMHS over IP with NZ, Australia 2/ other FIRs as opportune (French Pol., Samoa etc) 3/ ATFM, AMHS with attachment 4/ AMHS with Japan and Fiji		Staged approach	No dependencies

STRATEGY FOR IMPLEMENTATION OF COMMUNICATION SYSTEMS TO SUPPORT AIR NAVIGATION SERVICE IN THE ASIA/PACIFIC REGION

Considering that:

1) legacy AFTN circuits are required until the ground systems of ATM Service Providers (ASP) and Airspace Users (AU) in reliant states are compatible with ATS Message Handling Service (AMHS), the successor implementation of the Aeronautical Fixed Service (AFS);

2) the Aeronautical Telecommunication Network (ATN) is specified in ICAO SARPs and technical manuals as the network supporting AFS—implemented using either OSI protocols (ATN/OSI) or the Internet Protocol Suite (ATN/IPS)—for both ground-ground and ground-air services;

3) many states have implemented ATN and AMHS in accordance with ICAO guidance (regional BBIS providing dual OSI/IPS stack routing at the AMHS level);

4) AN Conf/12 endorsed the Global Air Navigation Plan version 4 including the Aviation System Block Upgrades of the Globally Interoperable Services and Data improvement area based on System-Wide Information Management (SWIM) message exchange patterns (specified in the SWIM Operational Concept as IP-based web services);

5) APANPIRG adopted the Seamless ATM Plan (Version 2) in 2016 which includes the regional objective for SWIM and Common Regional VPN (CRV) implementation; and

6) operational precedents of slightly different implementations of this SWIM concept exist in North America and Europe.

THE GENERAL STRATEGY FOR THE IMPLEMENTATION OF THE NECESSARY INTER-STATE COMMUNICATION SERVICES TO SUPPORT THE GLOBAL AIR NAVIGATION PLAN IN THE ASIA/PACIFIC REGION IS AS FOLLOWS:

a) continue deploying the ground-ground backbone network of ATN routers and AMHS Message Transfer Agents (MTA) needed to support operational ground-ground services (as the infrastructure supporting AFTN such as X.25 becomes obsolete) and the air-ground services expected to migrate to ATN/IPS.

b) acknowledge ICAO's acceptance of IP sub-networking and the precedent of PENS in Europe and FTI in North America and consider the consequent potential for superior approaches to APAC's ATN which is deployed as an aggregation of private leased point-to-point and other circuits including the Public Internet;

c) apply guidance from ICAO technical panels—primarily the Information Management and Communications panels—in progressing regional planning and co-ordination in terms of inter-state exchange of aeronautical, meteorological, flight information, voice communication services and surveillance data;

d) permit non-backbone States, and States in other regions with connections to the Asia/Pacific region, to connect their Message Transfer Agents (MTA) to backbone States using either the OSI-based ATN Internet Communications Services (ICS) or the ATN IPS on a bilateral basis;

e) permit States with limited traffic to operate only UA terminals connected to the MTA of another State, subject to bilateral agreement. Such connections should use the CRV's IP VPN. In cases where is not practical, use of the public Internet subject to appropriate security provisions and access control is acceptable;

f) complete migration from AFTN to AMHS within the time frame specified in the Regional Air Navigation Plan;

g) once a robust ATN has been established, transition from the OSI-based ATN ICS to the AMHS MTA network using the ATN/IPS as specified in ICAO Doc 9896;

h) consider options for augmenting the operational regional ATN to meet future operational requirements (including virtualizing the ATN over generic sub-networking infrastructure/services capable of supporting other higher-level communication services in addition to the ATN).

IN ORDER TO ACHIEVE THE ABOVE STRATEGY THE FOLLOWING ACTIONS ARE REQUIRED:

i) Enhance AMHS to include the File Transfer Body Part (FTBP) sub-set of extended AMHS in order to support the exchange of IWXXM data using FTBP;

j) Australia, Fiji, New Zealand and USA to replace their obsolete South Pacific AFS Network equipment with a subscription to the CRV managed service. In addition to sustaining operational voice and ground-ground data services, validate the 10 key points of the CRV proof-of-concept;

k) Remaining APAC states to monitor outcomes of the proof of concept and consider subscription to the CRV service if it is beneficial given their particular circumstance;

l) States and ASP/AU to participate in the SWIM Task Force and nominate subject matter experts to implement Phases 2 and Phase 3 of the Seamless ATM plan Version 2 adopted by APANPIRG in 2016. Three phases are identified in the SWIM Task Force's work plan:

    a. Definition phase
    b. Implementation phase 1 - expansion of services and preparation of phase 2
    c. Implementation phase 2 – generalization.

m) Support the transition to FIXM with initial focus on the regional ATFM.

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TABLE CNS II-APAC-1-ATS INTER-FACILITY DATA COMMUNICATION (AIDC) IMPLEMENTATION PLAN

EXPLANATION OF THE TABLE

Column

1 State/Administration – the name of the State/Administration;

2 Location of AIDC end system – the location of the AIDC end system under the supervision of State/Administration identified in column 1;

3 AIDC Pair – the correspondent AIDC end system;

Location – location of the correspondent AIDC end system

State/Administration – the name of the State/Administration responsible for management of the correspondent AIDC end system

A "/" is placed between the location and State/Administration

4 Transmission Means – the transmission means used for the AIDC messages exchanged between the corresponding AIDC pair, AFTN, AFTN/AMHS;

5 Target Date of Implementation – date of implementation of the AIDC end system in the form of xQyyyy or yyyy (quarter year);

6 Remarks – any additional information describing the AIDC end system or the AIDC service between the corresponding AIDC pair.

State/Administration	Location of AIDC System ATSU1	AIDC System Pair ATSU2 /Correspondent State – Administration	Transmission Means	Target date of Implementation xQyyyy or yyyy	Remarks
1	2	3	4	5	6
AFGHANISTAN	Kabul ACC	Kabul ACC /Afghanistan	AFTN/AMHS		
		Karachi ACC/Pakistan	AFTN		
AUSTRALIA	Brisbane ACC	Oakland ARTCC /USA	AFTN	Implemented	
			AFTN/AMHS		
		Auckland ACC /New Zealand	AFTN	Implemented	
			AFTN/AMHS		
		Melbourne ACC /Australia	AFTN	Implemented	
			AFTN/AMHS		
		Ujung Pandang ACC /Indonesia	AFTN	3Q2017	
			AFTN/AMHS		
		Nadi ACC /Fiji	AFTN	Implemented	
			AFTN/AMHS	Implemented	
		Port Moresby/PNG	AFTN		
			AFTN/AMHS	3Q2016	
	Melbourne ACC	Brisbane ACC /Australia	AFTN	Implemented	
			AFTN/AMHS		
		Jakarta ACC /Indonesia	AFTN		
			AFTN/AMHS		
		Colombo ACC/Sri Lanka	AFTN/AMHS	1Q2017	
		Mauritius ACC /Mauritius	AFTN	Implemented	
			AFTN/AMHS		
BANGLADESH	Dhaka ACC	Kolkata ACC /India	AFTN/AMHS	4Q2018	
		Yangon ACC /Myanmar	AFTN/AMHS	4Q2018	ICD V.2.0
CAMBODIA	Phnom Penh ACC	Bangkok ACC /Thailand	AMHS	3Q2018	
		Vientiane ACC/Laos PDR	AMHS	2016	
		Ho Chi Minh ACC/Viet Nam	AFTN/AMHS	2016	
CHINA	Beijing ACC	-	-		
		Ulaanbaatar ACC/Mongolia	AFTN		
	Sanya ACC	Hong Kong ACC /HK China	AFTN	Implemented	
		Ho Chi Minh ACC /Vietnam	AFTN		

	Kunming ACC	Yangon ACC /Myanmar	AFTN	4Q2017	ICD V.2.0
	Guangzhou ACC	Hong Kong ACC /HK China	AFTN		
	Taibei ACC	Hong Kong ACC /HK China	AFTN	Implemented	
		Fukuoka ATMC/Japan	AFTN	Implemented	ICD V.3.0
		Manila ACC/Philippines	AFTN	2Q2018	
	Urumqi ACC	Lahore ACC /Pakistan	AFTN/AMHS		
	Dalian ACC	Incheon ACC /Republic of Korea	AFTN	Implemented	
	Shanghai ACC	Fukuoka ATMC /Japan	AFTN		
HONG KONG, CHINA	Hong Kong ACC	Guangzhou ACC /China	AFTN	AIDC technical test completed in April 2017. AIDC interoperability test completed in June 2017.	
		Sanya ACC /China	AFTN	Implemented	
		Manila ACC /Philippines	AFTN		AIDC technical tests on – going and continue in 2017
		Taibei ACC /China	AFTN	Implemented	
MACAO, CHINA	Macao ATZ				Automatic transfer of control with adjacent ATC units is applicable instead of AIDC
FIJI	Nadi ACC	Auckland ACC /New Zealand	AFTN	Implemented	ICD V.1.0
		Brisbane ACC /Australia	AFTN/AMHS	Implemented	ICD V. 1.0
		Oakland ARTCC /USA	AFTN/AMHS	Implemented	ICD V.1.0
FRANCE ***FRENCH POLYNESIA NEW CALEDONIA***	Papeete ACC	Auckland ACC /New Zealand	AFTN	Implemented	ICD V. 2.0
		Oakland ARTCC /USA	AFTN	Implemented	
INDIA	Ahmedabad ACC	Karachi ACC /Pakistan	AFTN	2Q2018	
	Chennai ACC	Colombo ACC / Sri Lanka	AFTN/AMHS	4Q2017	
		Jakarta ACC /Indonesia	AFTN	2019	
		Kuala Lumpur ACC / Malaysia	AFTN	2Q2017	ICD V.3.0
		Male ACC /Maldives	AFTN		
		Yangon ACC /Myanmar	AFTN	4Q2018	ICD V.2.0
	Delhi ACC	Karachi ACC /Pakistan	AFTN		

		Lahore ACC /Pakistan	AFTN		
	Kolkata ACC	Dhaka ACC /Bangladesh	AFTN/AMHS	4Q2018	
		Yangon ACC /Myanmar	AFTN		ICD V.2.0
		Kathmandu ACC /Nepal	AFTN		
	Mumbai ACC	Karachi ACC /Pakistan	AFTN/AMHS	2018	
		Male ACC /Maldives	AFTN		
		Muscat ACC /Oman	AFTN		
		Seychelles ACC / Mauritius	AFTN		
	Varanasi ACC	Kathmandu ACC /Nepal	AFTN		
INDONESIA	Jakarta ACC	Melbourne /Australia	AFTN/AMHS		
		Colombo ACC / Sri Lanka	AFTN/AMHS		
		Singapore ACC /Singapore	AFTN/AMHS		
		Kuala Lumpur ACC / Malaysia	AFTN		
		Kota Kinabalu ACC /Malaysia	AFTN		
		Chennai ACC /India	AFTN	2019	
	Ujung Pasndang ACC	Brisbane ACC /Australia	AFTN	3Q2017	
			AFTN/AMHS		
		Manila/Philippines	AFTN/AMHS	4Q2017	
JAPAN	Fukuoka ATMC	Port Moresby ACC/ PNG	AFTN		
		Manila ACC /Philippines	AFTN		Technical Tests until 4Q2018
			AFTN/AMHS		
		Anchorage ACC /USA	AFTN	Implemented	ICD V.2.0
		Incheon ACC /Republic of Korea	AFTN	Implemented	ICD V.1.0
		Oakland ARTCC /USA	AFTN	Implemented	ICD V.2.0
		Shanghai ACC /China	AFTN		
		Taibei ACC /Taibei, China	AFTN	Implemented	ICD V.3.0
LAO PEOPLE'S DEMOCRATIC REPUBLIC	Vientiane ACC	Bangkok ACC /Thailand	AMHS	3Q2018	
		Hanoi ACC /Veitnam	AFTN	2017	
		Phnom Penh ACC /Cambodia	AMHS	2016	
		Yangoon/ Myanmar	AFTN	4Q2018	ICD V.2.0
		Ho Chi Minh/ Vietnam	AFTN/AMHS	2017	
MALAYSIA	Kuala Lumpur ACC				
		Bangkok ACC /Thailand	AFTN	3Q2018	ICD V.3.0
		Singapore ACC /Singapore	AFTN	4Q2017	ICD V.3.0

		Chennai ACC /India	AFTN	2Q2017	ICD V.3.0
		Ho Chi Minh ACC /Vietnam	AFTN		
		Jakarta ACC /Indonesia	AFTN		ICD V.3.0
	Kota Kinabalu ACC	Ujung Pandangr ACC /Indonesia	AFTN		
		Manila ACC /Philippines	AFTN/AMHS		ICD V.3.0
		Singapore ACC /Singapore	AFTN/AMHS		ICD V.3.0
		Jakarta ACC /Indonesia	AFTN		
	Kuching ACC	Singapore ACC /Singapore	AFTN		ICD V.3.0
MALDIVES	Male ACC	Mumbai ACC / India	AFTN		
		Chennai ACC /India	AFTN		
		Mauritius ACC/Mauritius	AFTN	2017	
		Colombo ACC/ Sri Lanka	AFTN	2017	
		Melborne ACC /Australia	AFTN	2017	
MONGOLIA	Ulaanbaatar ACC	Beijing ACC/ China	AFTN		
MYANMAR	Yangon ACC	Bangkok ACC /Thailand	AFTN/AMHS	3Q2018	ICD V.2.0
		Kolkata ACC /India	AFTN	4Q2018	
		Chennai ACC /India	AFTN	4Q2018	
		Kunming ACC /China	AFTN		
		Vientianne ACC /Lao PDR	AFTN	4Q2018	
		Dhaka ACC /Bangladesh	AFTN/AMHS	4Q2018	
NEPAL	Kathmandu ACC	Kolkata ACC /India	AFTN		
		Varanasi ACC/India	AFTN		
		Lhasa ACC /China	AFTN		
NEW ZEALAND	Auckland ACC	Brisbane ACC /Australia	AFTN	Implemented	ICD V.1.0
		Nadi ACC /Fiji	AFTN	Implemented	ICD V.1.0
		Oakland ARTCC /USA	AFTN	Implemented	ICD V.2.0
		Papeete ACC /French Polynesia	AFTN	Implemented	ICD V.2.0
			AFTN/AMHS		
PAKISTAN	Karachi ACC	Mumbai ACC /India	AFTN		
		Muscat ACC /Oman	AFTN		
		Tehran ACC /Iran	AFTN		
		Delhi ACC /India	AFTN		
		Ahmadabad ACC /India	AFTN	2Q2018	
		Kabul ACC /Afghanistan	AFTN		

	Lahore ACC	Delhi ACC /India	AFTN		
		Urumqui ACC /China	AFTN/AMHS		
		Tajakistan ACC /Tajakistan	AFTN		
PAPUA NEW GUINEA	Port Moresby	Brisbane ACC/Australia	AFTN		
			AFTN/AMHS	3Q2016	
PHILIPPINES	Manila ACC	Hong Kong ACC /Hong Kong, China	AFTN		Coordination for Technical test on the new ATM system –on going
			AFTN/AMHS		
		Singapore ACC /Singapore	AFTN	4Q2017	
			AFTN/AMHS		
		Taibei ACC/Taibei, China	AFTN	2Q2018	
			AFTN/AMHS		
		Kota Kinabalu ACC /Malaysia	AFTN		
			AFTN/AMHS		
		Ho Chi Minh ACC /Viet Nam	AFTN		Technical Tests on the new ATM system will continue with other ACCs until 4Q2018
			AFTN/AMHS		
		Oakland ARTCC /USA	AFTN		
			AFTN/AMHS		
		Fukoka ATMC /Japan	AFTN		
			AFTN/AMHS		
		Ujung Pandang ACC /Indonesia	AFTN	4Q2017	
			AFTN/AMHS		
REPUBLIC OF KOREA	Incheon ACC	Fukoka ATMC /Japan	AFTN	Implemented	ICD V.1.0
		Dalian ACC/China	AFTN	Implemented	ICD V.3.0
SINGAPORE	Singapore ACC	Ho Chi Minh ACC /Vietnam	AFTN/AMHS	Implemented	ICD V.3.0
		Manila ACC /Philippines	AFTN/AMHS	4Q2017	
		Jakarta ACC /Indonesia	AFTN/AMHS		
		Kuala Lumpur ACC /Malaysia	AFTN/AMHS	4Q2017	ICD V.3.0
		Kota Kinabalu ACC /Malaysia	AFTN/AMHS		
		Kuching /Malaysia	AFTN/AMHS		
SRI LANKA	Colombo ACC	Male ACC /Maldives	AFTN/AMHS	2017	
		Jakarta ACC / Indonesia	AFTN/AMHS		
		Chennai ACC /India	AFTN/AMHS	4Q2017	
		Melbourne ACC /Australia	AFTN/AMHS	1Q2017	

THAILAND	Bangkok ACC	Kuala Lumpur ACC /Malaysia	AFTN	3Q2018	ICD V.3.0
		Phnom Penh ACC /Cambodia	AMHS	3Q2018	
		Vientiane ACC /Lao PDR	AMHS	3Q2018	
		Yangon ACC /Myanmar	AFTN/AMHS	3Q2018	ICD V.2.0
UNITED STATES	Oakland ARTCC	Auckland OAC /New Zealand	AFTN	Implemented	ICD V.2.0
		Fukuoka ATMC /Japan	AFTN	Implemented	ICD V.2.0
		Nadi ATMC /Fiji	AFTN	Implemented	ICD V.2.0
		Brisbane ACC /Australia	AFTN	Implemented	ICD V.2.0
		Tahiti ACC /Tahiti	AFTN	Implemented	ICD V 2.0
		Port Moresby/PNG	AFTN	4Q2017	
		Manila /Philippines	AFTN		
	Anchorage ARTCC	Anchorage ARTCC /United States	AFTN	Implemented	ICD V 2.0
		Fukuoka ATMC /Japan	AFTN	Implemented	ICD V.2.0
		Oakland ARTCC /United States	AFTN	Implemented	ICD V.2.0
VIET NAM	Ho Chi Minh ACC	Sanya ACC /China	AFTN		
			AFTN/AMHS		
		Phnom Penh ACC /Cambodia	AFTN/AMHS	2016	
		Vientiane ACC /Lao PDR	AFTN/AMHS	2017	
		Singapore ACC /Singapore	AFTN/AMHS	Implemented	ICD V.3.0
		Manila /Philippines	AFTN		
		Kuala Lumpur /Malaysia	AFTN		
	Hanoi ACC	Vientiane ACC/Lao PDR	AFTN	2017	

CNS SG/21
Appendix F to the Report

Revised Template for Promulgation of ADS-B Avionics Equipage Requirements

On and after dd/mm/yyyy, if an aircraft operates on airways (insert routes)……at or above FLXXX……(or in defined airspace boundaries ……. at or above FLxxx):

the aircraft must carry serviceable 1090 MHz ES ADS-B transmitting equipment that has been certificated as meeting:

a) European Aviation Safety Agency - Certification Considerations for the Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) Application via 1090 MHZ Extended Squitter (AMC 20-24), or

b) European Aviation Safety Agency - Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance (CS-ACNS) Subpart D – Surveillance (SUR) (CS-ACNS.D.ADS-B), or

c) Federal Aviation Administration – Advisory Circular No: 20-165A (or later versions) Airworthiness Approval of Automatic Dependent Surveillance – Broadcast (ADS-B) Out Systems, or

d) the equipment configuration standards in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia.

Note: States are urged to include at least the standards stated in the template. States may include other standards allowed by the State's regulations.

The template adopted under Conclusion APANPIRG/26/42 be superseded by the revised template

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Proposed amendment to MID/ASIA Regional Supplementary Procedures (MID/ASIA 5-3)

The text of the 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

5.5 AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B)

5.5.1 The procedures contained in 5.5.2 – 5.5.4 shall be applicable in those portions of the following FIRs where an ADS-B-based ATS surveillance service is provided:

Auckland Oceanic (West of 180°), Bangkok, Beijing, Brisbane, Chennai, Colombo, Delhi, Dhaka, Fukuoka, Guangzhou, Hanoi, Ho-Chi-Minh, Hong Kong, Honiara, Incheon, Jakarta, Kabul, Karachi, Kathmandu, Kolkata, Kota Kinabaru, Kuala Lumpur, Kunming, Lahore, Lanzhou, Male, Manila, Melbourne, Mumbai, Nauru, New Zealand, Phnom Penh, Port Moresby, Pyongyang, Sanya, Shanghai, Shenyang, Singapore, Taibei, Ujung Pandang, Ulan Bator, Urumqi, Vientiane, Wuhan and Yangon.

5.5.2 An aircraft carrying 1 090 MHz extended squitter (1090ES) ADS-B equipment shall disable ADS-B transmission unless:

a) the aircraft emits position information of an accuracy and integrity consistent with the transmitted value of the position quality indicator; or

b) the aircraft always transmits a value of 0 (zero) for one or more of the position quality indicators (NUCp, NIC, NACp, or SIL); or

c) the operator has received an exemption granted by the appropriate ATS authority.

Note.— The following documents provide guidance for the installation and airworthiness approval of ADS-B OUT system in aircraft and ensure compliance with a) above:

1. *European Aviation Safety Agency (EASA) AMC 20-24; or*
2. *European Aviation Safety Agency (EASA) CS-ACNS (Subpart D – Surveillance – SUR); or*
3. *FAA AC No. 20-165A (or later versions) – Airworthiness Approval of ADS-B; or*
4. *Configuration standards reflected in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia*

5.5.3 Downlinked ADS-B data shall not be used by the ATC system for determining aircraft position when any of the position quality indicators (NUCp, NIC, NACp or SIL) have a value of 0 (zero).

5.5.4 Downlinked ADS-B data shall only be used by the ATC system for determining aircraft position when the position quality indicators (NUCp, NIC, NACp or SIL) have a value equal to or exceeding a minimum threshold, as determined by the appropriate ATS authority.

Proposed amendment to PAC Regional Supplementary Procedures (PAC 5-2)

5.5 AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B)

~~Nil~~

5.5.1 The procedures contained in 5.5.2 – 5.5.4 shall be applicable in those portions of the following FIRs where an ADS-B-based ATS surveillance service is provided:

Anchorage Oceanic, Auckland Oceanic (East of 180°), Easter Island, Nadi, Oakland Oceanic, and Tahiti

5.5.2 An aircraft carrying 1 090 MHz extended squitter (1090ES) ADS-B equipment shall disable ADS-B transmission unless:

a) the aircraft emits position information of an accuracy and integrity consistent with the transmitted value of the position quality indicator; or

b) the aircraft always transmits a value of 0 (zero) for one or more of the position quality indicators (NUCp, NIC, NACp, or SIL); or

a) the operator has received an exemption granted by the appropriate ATS authority.

Note.— The following documents provide guidance for the installation and airworthiness approval of ADS-B OUT system in aircraft and ensure compliance with a) above:

1. *European Aviation Safety Agency (EASA) AMC 20-24; or*
2. *European Aviation Safety Agency (EASA) CS-ACNS (Subpart D – Surveillance – SUR); or*
3. *FAA AC No. 20-165A (or later versions) – Airworthiness Approval of ADS-B; or*
4. *Configuration standards reflected in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia*

5.5.3 Downlinked ADS-B data shall not be used by the ATC system for determining aircraft position when any of the position quality indicators (NUCp, NIC, NACp or SIL) have a value of 0 (zero).

5.5.4 Downlinked ADS-B data shall only be used by the ATC system for determining aircraft position when the position quality indicators (NUCp, NIC, NACp or SIL) have a value equal to or exceeding a minimum threshold determined by the appropriate ATS authority.

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ADS-B IMPLEMENTATION STATUS IN THE APAC REGION

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
AFGHANISTAN	ADS-B & Multi Lateration system installed.				subject to safety assessment
AUSTRALIA	A total of 45 ADS-B ground stations and 28 WAM stations are operational (Total 73) ATC readiness since 2004 ADS-B data sharing with Indonesia operational since 2/2011. ADS-B data sharing planned with PNG ASMGCS using multilateration and ADS-B is operational in Brisbane, Sydney, Melbourne and Perth An additional 5 ADS-B ground stations are planned in 2017-2018. November 2016 – ADS-B converted to "radar like" Cat 48 for use in Melbourne Terminal Area. Perth to follow in 2017. Onesky replacing the current ATM system is expected to be fully operational in 2020 period.	2009/effective date of mandating in upper airspace 12/12/2013. An ADS-B mandate for all IFR aircraft applies from 2/2017.	All airspace for IFR aircraft from 2/2017	2.5NM, 3NM and 5 NM surveillance separations. 3/2016 - Manual of ATC updated to include 3 nautical mile separation using ADS-B in terminal control unit. 3/2017 – 2.5NM separation authorized using ADS-B when also used with radar. Vectoring allowed using ADS-B Precision Runway Monitoring for Sydney WAM	WAM is operating in Tasmania since 2010 with 5 NM separation service. WAM is also operating in Sydney for 3 NM separation service in TMA and for precision runway monitoring function.
BANGLADESH	Bangladesh has a plan to install four ADS-B ground stations to be installed at Dhaka, Cox's Bazar, Saidpur and Barisal Airports by 2019. ADS-B data will be integrated with new ATM system at Dhaka. Bangladesh has also a plan to install MLAT stations to provide surface movement control at HSIA, Dhaka as well as TMA coverage as a backup and complimentary RADAR coverage to the Dhaka MSSR.				Bangladesh is willing to share ADS-B data with neighbouring States to enhance the safety and surveillance capability in the sub-region.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
CAMBODIA	3 ADS-B ground stations installed at Phnom Penh, Siem Reap and Stung Treng City since 2011 and able to provide full surveillance coverage for Phnom Penh FIR. Cambodia is willing to share data with others.				
CHINA	5 UAT ADS-B stations used for flight training at CAFUC to be upgraded to support 1090ES by 2017. 308 ADS-B stations nationwide will deployed as 1st phase by the end of 2018. 1 ADS-B station operational in Sanya FIR since 2008. Sanya ATC system ready since July 2009 to support L642 & M771. Additional 4 ground stations deployed in 2015. Chengdu-Jiuzhai project finished in 2008 with 2 ADS-B stations Chengdu - Lhasa route surveillance project completed with 7 ADS-B stations using 1090ES since 2010. Trials operated from May 2011. 9 ADS-B stations deployed on the routes H15 and Z1 in 2015 1 ADS-B station deployed on the route B345 in 2017.	NOTAM issued on ADS-B trial operation			
HONG KONG CHINA	A larger-scale A-SMGCS covering the whole Hong Kong International Airport put into operational use in April 2009. Data collection/ analysis on aircraft ADS-B equipage in Hong Kong airspace conducted on quarterly basis since 2004. ADS-B trial using a dedicated ADS-B system completed in 2007.	AIP supplement issued on 29 Aug 2014 with 8 Dec 2016 as effective date.	HKFIR at or above FL290	5NM surveillance separation	Adopt phased approach to gradually extend ADS-B coverage into the Air Traffic Management System covering the HKFIR by end 2017.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
	ADS-B out operations over PBN routes L642 and M771 at or above FL 290 within HK FIR was effective in December 2013 and within HK FIR at or above FL 290 is planned for December 2016. ADS-B ground station infrastructure completed in 2013. ADS-B signal provided by Mainland China to cover southern part of Hong Kong FIR commenced in 2010 and will be put in operation use after commissioning of the new ATMS planned for November 2016.				
MACAO, CHINA	Mode S MSSR coverage available for monitoring purposes.				Airspace – ATZ only
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	ADS-B has been used as back-up surveillance of SSR since 2008.				
FIJI ISLANDS	ADS- B /multilateration ground stations installed. Situations awareness service provided in 2013. BY EMAIL	ADS-B mandate commencing form 31st December 2013			
FRANCE *(French Polynesia)*	ATM system is ready for ADS-B sensors/Installation of 5 first GS expected at beginning of 2017. 2nd stage with implementation of 7 GS and associated VHF coverage.			5 NM for airspace under coverage.	
INDIA	ASMGCS (SMR + Multilat) is operational at Delhi, Mumbai, Chennai, Kolkata, Bangalore and Hyderabad Airports. ASMGCS is also being installed at 05 more international airports.	AIP supplement issued on 17th April 2014 with effective date of implementation from 29th May 2014.			ADS-B in India to provide redundancy for radar and filling the surveillance gaps. ADS-B data trial operations commenced in 2015 in both

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
	ADS-B Ground Stations were installed at 21 locations across continental airspace and including Oceanic airspace at Port Blair. Procurement of 10 more ADS-B Ground stations is under consideration in 2016. ATM automation systems at 22 ATC Centres are capable of processing ADS-B data and provide the information on Display.				Non-radar and radar environment, in En-route & Terminal phases of flight for ATC purposes. AIP SUP 18 of 2014 issued
INDONESIA	30 Ground Station successfully installed. An additional 7 locations are planned for Papua region. ADS-B data sharing with Australia and Singapore.	24 July 2014 AIP Supplement No. 10/14 for using ADS-B for situation awareness effective from 18 Sep. 2014. 25 June 2015 AIP Supplement 08/15 on ADS-B Implementation (Tier-1) published with effective date on 25 June 2015.	Mandate from January 2018 for Class A airspace from FL290 to FL460	Intended to use for 5 NM separation	
JAPAN	Multilateration Systems for surface monitoring have been implemented at eight airports PRM (WAM) has been implemented at Narita Airport. En-route WAM system is manufacturing and will be put into operation in FY2018 Plan to evaluate accuracy of ADS-B information under RAD condition.				
LAO PDR.	2 ADS-B ground stations were installed in Vientiane and Luangprabang Int'l Airport in 2015 and the ADS-B data is fused with MSSR data target in the ATM Automation system.				

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
	3 additional ADS-B ground stations (DO-260B compliant) will be completed the installation at existing MSSR sites (Xiengkhouang, Savannakhet and Champasack) by 2016 to Q1 of 2017 to enhance the full ADS-B coverage of Lao FIR.				
MALAYSIA	Malaysia installing two (2) ADS-B ground stations in Genting Highland and Langkawi. The said ADS-B are expected to be commissioned by end of January 2017. Malaysia revised the plan to start mandate ADS-B requirement for implementation of ADS-B service for exclusive airspace/route without radar coverage within KL FIR by the end 2022. Specific Routes for ADS-B Implementation Plan: P574, N571, L510, P628, L645 & P627.	Revised Plan to issue mandate with target effective date by end of 2022.		ICAO approved surveillance separation.	
MALDIVES	4 ADS-B stations installed in Nov. 2012 (2 at Male' Ibrahim Nasir Intl Airport, 1 at Kulhudhuffushi Island in the North and 1 at Fuah Mulah Island in the South to cover 95% of the FIR at/above FL290. Maldives' ADS-B is integrated with the ATM system (in November 2013), and under observation prior to commencing trials. Maldives has planned to share ADS-B data with its adjacent FIRs. Updated by email				Seaplane in Maldives equipped with ADS-B for AOC purpose. These seaplanes have ADS-B IN functions as well.
MONGOLIA	Ten ADS-B ground stations for combination SSR and filled the surveillance gaps implemented in 2015 and integrated with ATM system and trial operation in early 2016.				

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
MYANMAR	ADS-B ground stations to be installed at Sittwe, Co Co Island by end of 2014 as 1st phase Yango , Lashio and Myeik -2015 as 2nd phase; Kengteng, Myitkyina in 2016. Completion of integration to Euro Cat. C. in 2014. Agreed to share ADS-B data with India, agreement on sharing being negotiated.				Supplement radar and fill the gaps to improve safety and efficiency ADS-C/CPDLC integrated in Yangon ACC since 2010.
NEPAL	ADS-B feasibility study conducted in 2007.				
NEW CALEDONIA	Three ADS-B ground stations commissioned in 2010 to cover international traffic at La tontouta airport serving Tontouta ACC & APP. It is used for Situation awareness and SAR.				
NEW ZEALAND	MLAT and ADS-B data is being used from the WAM system centred in the Queenstown area to provide surveillance coverage and surveillance separation (5 NM) over the southern half of the South Island of New Zealand. MLAT data from the Auckland MLAT system is used to support surface movement control at NZAA (Auckland). The New Zealand Navigation and Airspace and Air Navigation Plan "New Southern SKY" was issued in May 2014 34 ADS-B ground stations have been installed.	New Zealand has plans to introduce ADS-B OUT mandates as follows: ADS-B OUT equipment requirement for all aircraft operating in controlled airspace above FL 245 from 1 January 2019 ADS-B OUT equipment requirement for all aircraft operating in controlled airspace from 1 January 2022. A forward fit requirement for ADS-B equipage on all newly registered aircraft in 2017. The Rule will not		5 NM surveillance separation in en-route controlled airspace, and 3NM surveillance separation in terminal controlled airspace – where surveilled.	

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
		specify particular Technical Standing Orders (TSO), or transponder GNSS receiver models for position input into ADS-B.			
PAKISTAN	Tender for procurement of 5 ADS-B stations issued to be installed at Pasni, Lakpass, Rojhan, Dalbandin and Laram-top. Contract expected to be finalized by end of 2016. These stations will be DO260B compliant and operational by end of 2017.				
PAPUA NEW GUINEA	Initially 8 ADS-B sites to be deployed across PNG to provide seamless coverage above FL285. First site to be installed May/June 2016, with remainder to be completed between May-July 2017. Up to an additional 7 sites to be rolled-out in the 2018/19 timeframe. Site location will be dependent on infrastructure, security and an analysis of Phase 1 site performance. In late 2016, PNGASL (ANSP) will be implementing a replacement ATM automation system. The system will support fusion of ADS-B and RADAR data. From 2017 onwards, PNGASL will be looking to share ADS-B data with Indonesia and Australia.	An ADS-B mandate is on CASA PNG roadmap, however legislation yet to be developed. The Australian mandates will largely drive equipage for overflights (e.g. East-Asia to Australia/South Pacific). Expectation is that PNGASL (the ANSP) will lead development of ADS-B mandate framework. Initial steps may include mandate above F245 – but will depend on performance of Phase 1 ADS-B deployment. Country-wide mandate not envisaged before 2021/22.	None	**Air Traffic Control** <u>Approach/Arrivals</u> 2017 – 5NM 2018 – 3NM (approach) <u>Upper Airspace (>FL245)</u> 2017/18 – Situational awareness. 2018/19 – 5NM Note: Implementation dictated by training requirements and new ATM system transition priorities. **Flight Service** <u>Directed Traffic (FIS)</u> 2017 – Situational awareness	

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
PHILIPPINES	1. Manila ATM Center ADS B ground station to be completed in Q3 2017 and used for assessment/training purposes in Q2 2018 2. Bataraza, Palawan (Data sharing with Singapore , scheduled for completion in December 2017. 3. Phase I Projects to be completed in 2018: a. Palawan b. Iba, Zambales c. Bolinao, Pangasinan 3. Phase 2 Projects to be completed in 2019: a. Puerto Princesa, Palawan b. Jomalig Island c. Tambler Airport, GenSan d. Bojeador, Ilocos Norte				This should be completed and will be available on Q3 2017 for assessment / training purposes These four (4) ADS B ground stations will be completed in 2017. These four (4) ADS B ground stations will be completed in 2018.
REPUBLIC OF KOREA	ADS-B implemented 2008 for SMC in Incheon International Airport. ROK is developing ADS-B system since 2010 through R&D group. The testbed at Gimpor Airport supporting both 1090ES and UAT, undergoing operational testing (2013-16). At Incheon Intl Airport, promotion of surface surveillance (2014-17) In 2nd phase from 2015 to 2016, ADS-B ground stations will supplement to the radar in the terminal area and fill up the gap between radar coverage. The last phase from 2017 to 2020, ADS-B will be deployed for entire Incheon FIR.				
SINGAPORE	The airport MLAT system was installed in 2007 and "far-range" ADS-B sensor was installed in 2009. ATC system has been processing ADS-B data since 2013.	AIC was issued on 28 December 2010/effective from 12 Dec.2013. AIP supplement published in Nov 2013 to remind operators of ADS-B exclusive airspace	L642 and M771. At and above FL290. Also affect the following ATS routes N891, M753,	40nm on ATS routes L642, L644, M753, M771, N891 and N892 30nm implemented on 26th June 2014 on ATS routes L642,	Safety case was completed end of November. 2013.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
		implementation. AIP updated in Jan 2015 to remove the need for ops approval and to include the FAA standard as an additional accepted means to meet the equipage requirements.	L644 & N892	M753, M771 and N892; 20nm implemented on 10 Nov 2016 on ATS routes L642, M771, M753 and N892	
SRI LANKA	Total of 5 ADS-B Ground Receiving Stations and 01 Central Processing Station have been installed in March 2017. ADS-B Data is fused with Multi-sensor Data, including MSSR and ADS-C in the ATM system at Colombo Area Control Centre and will soon be ready for trial operations. New ATM system planned to be operational at Approach Control Centre in 2018 will also be capable of fusing Multi-sensor Data, including MSSR and PSR	Revised Date of Equipage mandate would be 31st Dec 2020. Ref: AIC A02/16	All ATS Routes within Colombo TMA	Initially 5 Nm within Approach Radar Coverage, 8 Nm within Area Radar Coverage & Procedural Separation minima outside Radar Coverage.	On completion of a safety assessment, use of ADS-B alone for ATC separation purposes.
THAILAND	MLAT has been in operation at VTBS since 2006 and was installed at VTBD in 2016 with the expectation to be operational in late 2017. At VTCC and VTSP, it is planned that MLAT will be installed starting in 2018. 6 ADS-B ground stations (DO-260B compliant) have been installed covering airspace at and above 20,000 feet primarily for research and development purpose and are being undergone the certification process by the Civil Aviation Authority of Thailand (CAAT) with a target date by the end of 2017. Additional ground stations capable of dual functions, i.e. ADS-B and WAM are planned to be installed	Aircraft equipage mandate planned to be issued in 2020 with the expected target effective date in 2025.			

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
	starting from late 2017 aiming at providing coverage from 13,000 to 45,000 feet for en-route operation and from 2,000 to 11,000 feet for TMA operation at 8 airports. Multiple surveillance sensor data, including SSR, ADS-B, and WAM, will be integrated into the new ATM systems which are expected to be operational in late 2018. Legal assessment regarding ADS-B data sharing with neighboring States is being conducted.				
TONGA	Trial planned for 2017				
UNITED STATES	As of 1 April 2016, the "baseline" set of Service Volumes planned by the FAA in 2007 are operational, using data from over 600 radio sites installed by Harris. Since 2007, FAA has planned and funded activities to activate additional Service Volumes that Harris will service using additional radio sites; all but 16 of these radio sites have been installed and are operational as of 1 April 2016. As of 1 April 2016, 135 of the 226 U.S. air traffic control facilities are using ADS-B for ATC separation; all En Route Centers and major Terminal facilities are using ADS-B for ATC separation; all remaining facilities are planned to be using ADS-B by 2019.	The U.S. ADS-B Out rule (14 CFR 91.225 and 14 CFR 91.227) was issued in May 2010 and specifies that the ADS-B Out mandate is effective on 1 January 2020.	Class A, B, and C airspace, plus Class E airspace above 10,000 ft MSL. See 14 CFR 91.225 for details.	The U.S. is using both terminal and en route (5nm) separation criteria, depending on the specific airspace and available surveillance information. Terminal separation includes the following separation criteria: - 3nm - 2.5nm - independent parallel approach operations down to 4300 ft centreline separation - dependent parallel approach operations down to 2500 ft centreline separation (currently 1.5 nm diagonal distance).	

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
VIET NAM	Two phases ADS-B implementation plan adopted. Phase 1 implemented in March 2013. Phase 2 commenced in 2015 for whole lower and upper Hanoi FIR and 2018 for Ho Chi Minh FIR	AIC issued on 20 June 2013/ADS-B mandating effective from 12 December 2013 in Ho Chi Minh FIR.	M771, L642, L625, N892, M765, M768, N500 and L628 At/above FL290.		Operators required to have operational approval from State of aircraft registry.

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List of Conclusion adopted by CNS SG on behalf of APANPIRG on technical matters

Conclusion CNS SG/21-C1: Withdrawal of the GOLD		
What: That, States take note of the publication of ICAO Doc 10037 – *Global Operational Data Link (GOLD) Manual* and *Doc 9869 – PBCS Manual*, and the Global Operational Datalink Document (GOLD) be removed from the ICAO Asia/Pacific Regional Office website.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: GOLD Version 2 has been superseded by ICAO Docs 10037 and 9869.	Follow-up: ☐Required from States	
When: 21-Jul-17	Status: Adopted by Subgroup	
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:		

Conclusion CNS SG/21-C4: CRV common provisions and implementation of pilot Project		
What: That, considering: i) the successful outcome of the CRV evaluation process and subsequent negotiations with CRV Pioneer States in December 2016 and January 2017; ii) the need for Australia, Fiji, New Zealand and USA to cope with obsolescence of their existing SPAN infrastructure; and iii) that the ICAO Regional Office has sent the State Letter T 8/2.10 & T 8/2.11:AP057/17 (CNS) on 22 May 2017 to APAC States and Administrations regarding the use of CRV common provisions: a/ all APAC States/Administrations consider implementing CRV at their earliest convenience using the CRV common provisions; b/ to optimize success of the long term service, Australia, Fiji, New Zealand and USA be urged to implement the CRV for pilot implementation in coordination with ICAO Regional Office and provide a proof of concept on the engineering package by CRV OG/3; and c/ ICAO be urged to organize a workshop to support States in their decision-making and transitioning into CRV		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Announce CRV Provisional Winning Provider	Follow-up: ☒ Required from States	
When: 5 December 17	Status: Adopted by Subgroup	
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: PCCW Global, Ltd		

Conclusion CNS SG/21-C7: AIDC Implementation Guidance Document	
What: That, the AIDC Implementation Guidance Document (AIDC IGD) provided in **Appendix D** is adopted.	**Expected impact:** ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: This AIDC IGD is developed by the APAC AIDC Implementation Task Force to facilitate harmonized implementation of AIDC between ATSUs	
When: 21 July 2017	**Status:** Adopted by the Sub-group
Who: ☒Sub-groups ☒ APAC States ☐ ICAO APAC RO ☐ IATA ☐ICAO HQ ☐Other:	

Conclusion CNS SG/21-C14: Asia/Pacific ADS-B Problem Reporting Database	
What: That, noting the launch and availability of the Asia/Pacific Regional ADS-B Avionics Problem Reporting Database (APRD) on the ICAO Asia/Pacific Regional Office website with effect from 21 July 2017, States are urged to: 1. Nominate reporting/assessment focal points for the APRD to the ICAO APAC Regional Office by not later than 30 September 2017; and 2. Make full use of the APRD for reporting ADS-B avionics problems and sharing experience as well as follow-up actions through the APRD web-page.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To facilitate implementation of the ADS-B based surveillance service through sharing and monitoring the reported implementation issues.	Follow-up: ☒ Required from States
When: 21-JUL-2017	Status: Adopted by Subgroup
Who: ☐Sub groups ☒ APAC States ☒ ICAO APAC RO/RSO ☐ICAO HQ ☐Other:	

<table>
<tr><td colspan="3">Conclusion CNS SG/21-C15: Revised ADS-B Implementation and Operations Guidance Document</td></tr>
<tr><td colspan="2">What:
That, the revised ADS-B Implementation and Operations Guidance Document (AIGD) provided in Appendix I to the Report be adopted.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To provide updated ADS-B implementation guidance to State/Administrations in the APAC Region</td><td colspan="2">Follow-up: Required from States</td></tr>
<tr><td>When: 21-JUL-2017</td><td colspan="2">Status: Adopted by Subgroup</td></tr>
<tr><td colspan="3">Who: ☒ Sub groups ☒ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
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A list of draft Conclusions from CNS SG/21 for Consideration by APANPIRG/28 Meeting

Conclusion APANPIRG/28/XX: Upgrade AMHS to support IWXXM traffic	
What: That, In order to support the requirement to exchange MET information in IWXXM format, States/Administrations be urged to upgrade AMHS systems (AMHS server and User Agent) by November 2020 to either Extended AMHS or Basic ATS Message Handling Service plus File Transfer Body Parts sub-set of extended AMHS for Binary data exchange (FTBP) functional groups as defined in Doc 9880 Part IIB section 3.4.1.	Expected impact: ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Need to support IWXXM format data by AMHS	
When: 21 July 2017	Status: to be adopted by PIRG
Who: ☒Sub-groups ☒ APAC States ☐ ICAO APAC RO ☐ IATA ☐ICAO HQ ☐Other:	

Decision APANPIRG/28/XX: Dissolution of CRV Task Force	
What: Noting that the terms of reference b/ to d/ have been completed and that completion of a/ and e/ will be performed by CRV OG on the basis of mature CRV implementation plan, and CRV Operating Manual, That, the CRV Task Force be dissolved.	Expected impact: ☐ Political / Global ☒ Inter-regional ☐Economic ☐ Environmental ☒ Ops/Technical
Why: the CRV TF terms of reference b/ to d/ have been completed and completion of a/ and e/ will be performed by CRV OG on the basis of mature CRV implementation plan, and CRV Operating Manual	
When: December 2016	Status: To be adopted by PIRG
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☒ APANPIRG ☒ Other: MID States	

Conclusion APANPIRG/28/XX: Revised Strategy for Implementation of Communication systems to support Air Navigation Service	
What: That, the revised Strategy for implementation of Communication systems to support Air Navigation Service provided in **Appendix C** to WP/06 be adopted.	**Expected impact:** ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: The Strategy for implementation of Communication systems for APAC region was adopted by APANPIRG in 2010. The strategy requires to be updated based on the development.	
When: September 2017	**Status:** to be adopted by PIRG
Who: ☒Sub-groups ☒ APAC States ☐ ICAO APAC RO ☐ IATA ☐ICAO HQ ☐Other:	

<table>
<tr><td colspan="3">Conclusion APANPIRG/28/XX: Amendment of the Management Service Agreement for CRV project (RAS14801)</td></tr>
<tr><td colspan="2">What:
Recognizing that ICAO Technical Cooperation Bureau satisfactorily completed all the defined work items in the initial MSA and ProDoc 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,
i) all Pioneer States are encouraged to counter-sign the amended Pro Document provided in Attachment X;

ii) any Pioneer State not countersigning is entitled to get its share of the remaining fund balance back; and

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.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td colspan="2">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.</td><td>Follow-up: ☒Required from States</td></tr>
<tr><td colspan="2">When: 3 December 2017</td><td>Status: to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: CRV Pioneer States</td></tr>
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<tr><td colspan="3">Conclusion APANPIRG/28/XX: Revised ANP Table CNS II APAC-1 – AIDC Implementation Plan</td></tr>
<tr><td colspan="2">What:
That, Revised Table CNS II APAC-1-AIDC Implementation Plan provided in Appendix E to WP/06 be amended in accordance with the established procedure.</td><td>Expected impact:
☐ Political / Global
☒Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td colspan="3">Why: The Table CNS II APAC-1-AIDC Implementation Plan was updated by the APAC AIDC Task Force and it should be approved through an amendment procedure (PfA).</td></tr>
<tr><td>When: 21 July 2017</td><td colspan="2">Status: to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒ Sub-groups ☒APAC States ☐ ICAO APAC RO ☐ IATA ☐ICAO HQ ☐Other:</td></tr>
</table>

<table>
<tr><td colspan="3">Conclusion APANPIRG/28/XX: Coding of Asia-Pacific SBAS service provider IDs in the avionics</td></tr>
<tr><td colspan="2">What:
That, ICAO, with the support of ICCAIA, be urged to:
a) coordinate the appropriate coding of Asia-Pacific SBAS service provider IDs in the avionics as early as possible through the implementation of ARINC Nav data specification (revision 21); and

b) advise about the advantages and disadvantages to use the SBAS service provider ID 15 currently available with revision 20 as a workaround pending the implementation of a)</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☒ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: LPV implementation will be delayed as long as the appropriate coding of Asia-Pacific SBAS service provider IDs in the avionics, or the workaround, is not available in Navigation databases</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 30 December 2017</td><td colspan="2">Status: to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☒ICAO HQ ☒Other: Navigation system panel, PBN Study Group</td></tr>
</table>

<table>
<tr><td colspan="2">Conclusion APANPIRG/28/XX: Establishment of National PBN stakeholders forums</td></tr>
<tr><td>What: Noting that the insufficient articulation between the regulatory and implementation processes is a major cause for the slow implementation of PBN, a lack of efficiency and an increased risk in operations:
That, States be urged to establish a national PBN stakeholders forum (or a similar mechanism) to review and coordinate on an ongoing basis:

a) the national PBN implementation and regulatory roadmaps, taking into account the global and regional objectives, the fleet readiness, the best equipped/best served principle, and the reduction of environmental impacts;

b) the training policies and programmes for all stakeholders;

c) the necessary changes to the legal and regulatory framework; and

d) the expected and actual benefits of PBN implementation in terms of safety, efficiency, schedule reliability, CO2 emissions and noise exposure, airport accessibility, and reduced infrastructure costs.

The forum should include regulator, ANSP, aerodrome operators, Instrument Flight Procedure Design organizations, all airspace users, and as required communities impacted by noise exposure and carbon emission levels.

Note: the PBN implementation plan is an appropriate tool to support such a national coordination; IFSET is an appropriate tool to demonstrate the expected and actual benefits of PBN implementation</td><td>Expected impact:
☒ Political / Global
☐ Inter-regional
☒ Economic
☒ Environmental
☒ Ops/Technical</td></tr>
</table>

Why: The insufficient articulation between the regulatory and implementation processes is a major cause for the lack of PBN implementation, a lack of efficiency and an increased risk in operations	Follow-up: ☒Required from States
When: 16 March 2018	Status: to be adopted by PIRG
Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion APANPIRG/28/XX: Update of the Catalogue of Flight Validation and Inspection Service providers in Asia and Pacific Region	
What: That, a) States provide their flight validation and inspection unit's capabilities to reflect PBN procedure flight validation and flight inspection capabilities through an ICAO RSO's survey. b) CAO Asia and Pacific Regional Office update the Catalogue of Flight Inspection Units Asia and Pacific Regions based on the survey outcomes.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: To facilitate PBN Implementation through shortening the PBN flight validation period	Follow-up: ☒Required from States
When: 28 February 2018	Status: to be adopted by PIRG
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: ICAO RSO	

Conclusion APANPIRG/28/XX: Revised Template for Promulgation of ADS-B Avionics Equipage Requirements	
What: That, 1. States intending to implement ADS-B based surveillance service for a defined airspace and having not published regulations be urged to promulgate mandating rules for ADS-B Avionics Equipage Requirements as soon as possible using the revised Template provided in **Appendix F** to WP/06; 2. States that have implemented ADS-B based surveillance services are also urged to update their ADS-B avionics equipage requirements to align with the template; *Note: States are urged to include at least the standards stated in the template. States may include other standards allowed by the State's regulations.*	Expected impact: ☒ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ OPS/Technical

3. The template adopted under Conclusion APANPIRG/26/42 be superseded by the revised template; 4. The relevant parts in the ADS-B Implementation and Operations Guidance Document (AIGD) be updated accordingly.	
Why: To update the reference documents in the Template adopted earlier by APANPIRG.	Follow-up: ☒ Required from States
When: 14 September 2017	Status: to be adopted by APANPIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion APANPIRG/28/XX: Regional Supplementary Procedures for ADS-B Operation	
What: That: 1. the Proposal for Amendment (PfA) to the Regional Supplementary Procedure (SUPP Doc 7030) be processed in accordance with established procedure, based on information provided in **Appendix G** to WP/06; and 2. ICAO be requested to coordinate the PfA as required, with the objective of achieving inter-regional alignment of requirements for operation of ADS-B.	Expected impact: ☐ Political / Global ☒ Inter-regional ☒ Economic ☐ Environmental ☒Ops/Technical
Why: Need to update relevant provisions in SUPPs based on the developments of the equipment standards and need to issue PfA for PAC region	Follow-up: ☒ Required from States
When: 14 September 2017	Status: to be adopted by PIRG
Who: ☐Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ICAO HQ ☐Other:	

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