FINAL REPORT

THE THIRTY-FIRST MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/31)

Video Teleconference, 14 to 16 December 2020

The views expressed in this Report should be taken as those of the APANPIRG and not of the Organization. This Report will be presented to the Air Navigation Commission/Council and any formal action taken will be published in due course as a supplement to the Report.

Approved by the Meeting
and published by the ICAO Asia and Pacific Office

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PART I – HISTORY OF THE MEETING

1.1 Introduction

1.1.1 The Thirty-first Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/31) was held as a video teleconference from 14 to 16 December 2020.

1.2 Attendance

1.2.1 The Meeting was attended by **193** participants from **23** Member States, **2** Special Administrative Regions of China, and **8** International Organizations (AAPA, ACI, CANSO, IATA, ICAO, IFALPA, IFATCA and IFATSEA).

1.2.2 A list of participants is provided at **Attachment 1** to the Report.

1.3 Opening of the Meeting

1.3.1 Mr. Arun Mishra, Regional Director, ICAO Asia/Pacific Office welcomed the participants from the Member States and International Organizations, and delivered the welcome address. The full text of the address by the ICAO Regional Director is included as **Attachment 2** to this Report.

1.3.2 Mr. Kevin Shum, Director-General of CAA Singapore and the Chairperson of APANPIRG, delivered a welcome address to the delegations.

1.4 Officers and Secretariat

1.4.1 Mr. Kevin Shum, Director-General of CAA Singapore and the Chairperson of APANPIRG presided over the Meeting.

1.4.2 Mr. Arun Mishra, Regional Director, ICAO Asia/Pacific Office, was the Secretary of the Meeting.

1.4.3 The Meeting was assisted by Mr. Herman Pretorius and Mr. Hervé Forestier from Air Navigation Bureau of ICAO Headquarters, Mr. Manjit Singh, Deputy Regional Director, Mr. Raphael Guillet, Chief of RSO and Regional Officers from ICAO APAC Office and RSO.

1.5 Agenda of the Meeting

1.5.1 The meeting adopted the following Agenda:

Agenda Item 1A: Progress Update on Beijing Declaration Commitments

Agenda Item 1B: Follow-up on the Outcome of APANPIRG/30 Meeting

1B.1: Review of the action taken by the ANC/Council on the Report of APANPIRG/30

1B.2: Review status of implementation of APANPIRG/30 Conclusions and Decisions

1B.3: Review status of implementation of APANPIRG outstanding Conclusions and Decisions

Agenda Item 1C: ICAO APAC COVID-19 Contingency and Recovery Planning Group (ACCRPG) Activities

Agenda Item 1D: Aviation Safety and RASG-APAC activities

Agenda Item 2: Global and Inter Regional Activities

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.0: Regional and National Performance Framework

3.1: AOP

3.2: ATM

3.3: RASMAG

3.4: CNS

3.5 MET

3.6: Other Air Navigation Matters

Agenda Item 4: Regional Air Navigation Deficiencies

Agenda Item 5: Future Work Programme

Agenda Item 6: Any Other Business

1.6 Working Arrangements, Language and Documentation

1.6.1 The working language of the meeting was English inclusive of all documentation and this Report. Information Papers (IP) and Working Papers (WP) considered by the meeting are listed in the **Attachment 3** to this Report and available at APAC website.

1.7 Conclusions and Decisions - Definition

1.7.1 The APANPIRG records its actions in the form of Conclusions and Decisions with the following significance:

1) Conclusions deal with matters which, in accordance with the Group's Terms of Reference, require the attention of States or actions by ICAO in accordance with established procedures; and

2) Decisions deal with matters of concern only to the APANPIRG and its contributory bodies.

1.7.2 Lists of Conclusions and Decisions are given on pages i-4 to i-5.

1.8 Terms of Reference of APANPIRG

1.8.1 The revised Terms of Reference of APANPIRG approved by the President of the ICAO Council on 20 April 2020 is available in **Attachment 4**.

1.9 Adoption of Draft Report

1.9.1 On 16 December 2020, the meeting reviewed and adopted the draft report which has been finalized after incorporating some minor editorial comments received from States/Administrations and International Organisations.

1.10 Closing Remarks

1.10.1 In closing the meeting, the Chair thanked all delegates for their cooperation and active participation and the Secretariat for their smooth and efficient organisation of the meeting despite it being held virtually for the first time.

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List of Conclusions

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List of Decisions

Decision 31/1 – Proposal for Amendment of APA-CDM/TF TOR

Decision 31/9 – Amend AAITF Terms of Reference

Decision 31/16 – Updates to Terms of Reference and Work Plan of MET SG

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Agenda Item 1A: Progress Update on Beijing Declaration Commitments

Where does APAC stand with the Beijing Declaration Commitments? (WP/02)

1A.1 The Meeting noted ICAO's updates on Beijing Declaration Commitments proposing to review the current status of the APAC States' commitments in the field of Air Navigation Services, specifically Aeronautical Information Management (AIM), Performance Based Navigation (PBN), ground telecommunication infrastructure (CRV), civil military cooperation, surveillance capability (ADS-B), Air Traffic Flow Management (ATFM) / Collaborative Decision Making (CDM), and National Air Navigation Plan (NANP).

1A.2 The Beijing Declaration was the high level commitment to public, industry and investors, which was adopted in the first *Asia Pacific Ministerial Conference on Civil Aviation* (Beijing, China, 31 January – 1 February 2018). All delegations from 36 States unanimously agreed to commit on improving the Aviation Safety and Air Navigation Services formalizing their commitments as high-priority with aviation safety and efficiency objectives. The Beijing Declaration could help the Civil Aviation Authorities to make their Ministers well aware of the current challenges and needs in human resources and funding to cope with the traffic growth.

1A.3 The Meeting was informed the current status of the States' commitments in the field of Air Navigation Services for the APAC Region, noting that some improvements have been made but in slow pace.

1A.4 For example, India, Vietnam, Japan, Fiji and Indonesia published new PBN procedures for international airports. CRV implementation is also improving with four new States/Administrations who joined CRV compared to last year. Besides, four new States installed ADS-B ground stations.

1A.5 Thus, States were invited to continue their efforts on complying with the Beijing Declaration Commitments in a timely manner and by the target year 2022. ICAO also encouraged States to ensure that correct data is transmitted to the Regional Office for effective compliance monitoring.

1A.6 APANPIRG/31 noted Indonesia's update that it had developed PBN implementation roadmap by prioritizing for high density airports, with implementation at international airports by 2021. Indonesia would continue the implementation of PBN at domestic airports with dense traffic, and expand the PBN routes with RNAV-2 specification from Aceh to Papua.

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Agenda Item 1B: Follow-up on the Outcome of APANPIRG/30 Meeting

Review of the Action Taken by the ANC and the Council on the Report of APANPIRG/30 and the 9th Meeting of the Regional Aviation Safety Group Asia and Pacific (RASG-APAC/9) and Outcome of the Council's Review of the Consolidated Annual Report on Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs), Covering the Period from April 2019 to March 2020 (WP/03)

1B.1 The Meeting was presented with the outcome of the review by the Air Navigation Commission (ANC) and ICAO Council of the consolidated annual report on Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs), covering the period from April 2019 to March 2020, especially the Report of the APANPIRG/30 Meeting.

1B.2 The Meeting noted the actions to be taken by the Council and the PIRGs and RASGs to address the identified common global challenges faced by the regions. The Meeting was informed that the Council noted with concern, that the only Significant Safety Concern (SSC) in the Asia and Pacific Region had not been resolved as yet.

1B.3 With regards to the upgrade of ATS message handling system (AMHS) to support the requirement of the ICAO Meteorological Information Exchange Model (IWXXM), Version 3 as reported by APANPIRG/30, the Meeting noted that the Council requested that PIRGs monitor the implementation of AMHS and report thereon in order to identify additional measures required.

1B.4 The ICAO requirement that METAR/SPECI, TAF, SIGMET, AIRMET and volcanic ash/tropical cyclone/space weather advisory information shall be disseminated in IWXXM GML form (in accordance with Amendment 78 to Annex 3) became applicable as of 5 November 2020.

1B.5 The ICAO requirement that significant weather (SIGWX) forecasts should be disseminated in IWXXM GML form (in accordance with Amendment 79 to Annex 3) will become applicable as of 4 November 2021.

1B.6 With regards to the low-level feedback from States to ICAO State Letters, the Meeting noted that the Council requested the Secretary General to analyze and identify a global solution to address the low level of response to State Letters and the ANC to review the information and report to the Council. The Meeting reminded States of their obligation to respond to ICAO State Letters in a timely manner.

1B.7 The Meeting noted with satisfaction that the Council requested the ANC to identify the cause of the underlying issues and propose remedial actions to address the issues. The Meeting agreed that these had been systematic issues that required resolution as a matter of urgency, as limited progress is made. The Meeting concurred that remedial action identified by the ANC at the global level was required as a matter of urgency.

Status of Implementation of APANPIRG/30 Conclusions and Decisions (WP/04)

1B.8 The Meeting reviewed the actions taken by States/ICAO and the progress made on the APANPIRG/30 Conclusions and Decisions.

1B.9 Among 15 Conclusions and 4 Decisions, the Meeting noted that actions had been taken to close/complete all items except 2 Conclusions (C 30/13 & C 30/14) which were in progress. The updated status on implementation of APANPIRG/30 Conclusions and Decisions is provided in **Appendix A** to the Report on Agenda Item 1B.

Status of Implementation of Outstanding APANPIRG Conclusions and Decisions (WP/05)

1B.10 The Meeting reviewed the action taken by States/ICAO and progress made on the APANPIRG Outstanding Conclusions and Decisions up to its 29th Meeting.

1B.11 APANPIRG noted that out of the 3 outstanding Conclusions up to APANPIRG/29, follow-up actions on C 28/25 and C 28/28 had been completed, whereas action on C 28/19 was still in progress and remained open. The updated status on outstanding Conclusions up to APANPIRG/29 is provided in **Appendix B** to the Report on Agenda Item 1B.

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Appendix A to the Report on Agenda Item 1B

APANPIRG/30 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/1 **A & B**	**2020 PIRGs and RASGs Global Symposium – Innovation**	That, given the rapid pace of innovation in aviation and the important role that PIRGs and RASGs play in facilitating proper planning and facilitate the implementation of the relevant innovations in a coordinated and timely manner, it is imperative that:	ICAO RO	State Letter	30 November 2019	Ref.: AN 3/3 – AP130/19 (AGA) dated 29 November 2019	
		a) APAC States identify and propose innovation activities to ICAO that they are aware of in their State or Region that may be of global interest to facilitate planning by March 2020;	APAC States and Administrations	Action in accordance with the Conclusion.	As soon as practicable		
		b) Propose topics for discussion during PIRG/RASG Symposium related to innovation by March 2020;					
		c) States plan participation in the PIRG/RASG Global Symposium and Second ICAO Innovation Fair to be held in Montréal tentatively from 26 to 30 October 2020;					
		d) The Chairpersons of APANPIRG and RASG-APAC plan attendance of the first meeting of the ICAO PIRG/RASG Global Coordination Group, tentatively scheduled for 25 October 2020.	Chairperson of APANPIRG	Action in accordance with the Conclusion.	25 Oct. 2020	Meeting postponed due to COVID-19 Pandemic. Date TBC. COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/2 **A & B**	**Identification and Reporting of Common Challenges Experiences at the Regional Level**	That, there is a need for the PIRGs and RASGs to review the format of presentation of common challenges experienced in the regions and report thereon in a detailed standardized and harmonized way and therefore it was concluded that the meeting: a) agree to the format of reporting regional challenges as contained in Appendix A to the Report on Agenda Item 2; and b) report the regional challenges identified in the format proposed.	ICAO RO	Format included in APANPIRG Procedural Handbook	6 November 2019	Included the format as Attachment D to the draft APANPIRG Procedural Handbook, 6th Edition COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
D 30/3 **A & B**	**Proposal for Amendment of APA-CDM/TF TOR**	That, a) Airport Collaborative Decision Making Task Force (APA-CDM/TF) completed all tasks assigned under its existing Terms of Reference; b) Only some airports implemented A-CDM among 51 international airports (as per Asia/Pacific Seamless ATM Plan) that need to implement A-CDM; c) Some States raised their needs to APA-CDM/TF for getting assistance in A-CDM implementation; d) The meeting also discussed and agreed that some additional tasks were necessary to be performed by the Task Force as presented at **Attachment A** to the **Appendix C** to the AOP/SG/3 Report; e) The APA-CDM/TF meeting decided to recommend the Option a) as stated in **APA-CDM/TF/4-WP/09** (para 4.5 (a) of the AOP/SG/3 Report) for extending the APA-CDM/TF for two years till November 2021; and f) Airport Collaborative Decision Making Task Force (APA-CDM/TF) TOR placed in **Appendix A** to the Report on Agenda Item 3.1 be amended in order to assist States in harmonising implementations of A-CDM at high density international aerodromes and meeting performance expectations as per Asia/Pacific A-CDM Implementation Plan.	ICAO RO APAC States and administrations	State Letter Notified APA-CDM/TF To note the ToR amendment	30 November 2019 As soon as practicable As soon as practicable	Ref.: AN 3/3 – AP131/19 (AGA) dated 29 November 2019 TOR presented at APA-CDM/TF/5 Meeting. COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/4 **A & B**	**Certification of aerodromes used for international operations in Asia Pacific States**	That, the Ministers of Asia and Pacific States committed to certify all aerodromes used for international operations by 2020 through the Beijing Declaration. The AOP/SG monitors the aerodrome certification implementation commitment of the Beijing Declaration and reports progress to the annual APAC DGCA Conference through the APANPIRG. States and Aerodrome Operators should take effective actions on Action Item 55/42 agreed at the 55th Conference of the APAC DGCA. In view of above, the Meeting: a) Urged States and their Aerodrome Operators that have yet to certify aerodromes used for international operations to take an effective action on the 55th DGCA Action Item 55/42; b) Urged States to provide periodic updates on the progress of the certification of aerodromes to the ICAO APAC Office; c) Urged States that have not published the status of certification of aerodromes in State's AIP to publish the status as soon as possible in accordance with Annex 14 Vol I (para. 2.13.1), PANS-Aerodromes (para. 2.3.7) and Appendix 2 to PANS-AIM (Doc 10066); d) Agreed that, if any aerodrome used for international operations fails to obtain an aerodrome certificate from the Regulatory Authority by fulfilling ICAO Annex 14 requirements under the aerodrome certification process by 2020, or fails to maintain the aerodrome certificate already obtained, will be subject to being included on the APANPIRG AOP Air Navigation Deficiency list	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion	30 November 2019 Before 31 Dec. 2020. Before 31 Dec. 2019	Ref.: AN 3/3 – AP132/19 (AGA) dated 29 November 2019 Action completed as endorsed by APANPIRG/31 the Air Navigation Deficiency List in AOP field which was endorsed by AOP/SG/4. [COMPLETED]	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
		against para. 1.4 (certification of aerodromes) of the Annex 14, Volume I; e) Agreed that, if any States fail to achieve the target of the Beijing Declaration on certification of aerodromes by 2020 will be subject to being included on the APANPIRG AOP Air Navigation Deficiency list against para. 1.4 of the Annex 14, Volume I; f) Agreed that, if any States fails to publish the status of certification of aerodromes in State's AIP by December 2019 will be subject to being included on the APANPIRG AOP Air Navigation Deficiency list against ICAO Annex 14 para. 2.13.1 a), PANS-Aerodromes, para. 2.3.7 and Appendix 2 to PANS-AIM.					
C 30/5 **A & B**	**Asia/Pacific Seamless ANS Plan**	That, given the urgency and priority of Air Navigation Service (ANS) planning and modernization, and the lack of progress in implementing the Aviation System Block Upgrade (ASBU) Block 0, Asia/Pacific States are urged to: (1) review Version 3.0 of the Asia/Pacific Seamless ANS Plan appended as **Appendix A to the Report on Agenda Item 3.2**; and (2) consider utilising the Asia/Pacific Seamless ANS Plan to develop a National Air Navigation Plan (NANP) after considering the NANP Template at **Appendix B to the Report on Agenda Item 3.2**, to enable timely implementation of applicable Seamless ANS elements.	ICAO RO APAC States and Administrations	Upload Seamless ANS Plan V3.0 to the website; State Letter Review the Plan and develop a NANP	15 November 2019 As soon as practicable	Ref. T 3/10.0 – AP122/19 (ATM) dated 14 November 2019 COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/6 **A & B**	**ICAO HQ Support for Regional ANS Implementation**	That, ICAO HQ is invited to: (1) given the greatly increased number and complexity of Aviation System Block Upgrade (ASBU) elements in the draft 6th Edition of the Global Aviation Navigation Plan (GANP), the redefinition of ASBU Block 0 elements that were expected to be completed by 2019, and the need for more detailed and comprehensive guidance provided on the ASBU Portal for each element than is currently provided, consider: (i) the consequences for States of different capabilities to ensure that the No Country Left Behind (NCLB) policy is fully considered; and (ii) the extra resources, tools and training required to enable States to be able to understand, review, determine priorities and costs/benefits, and implement the applicable ASBU elements; and (2) ensure that the redevelopment of the Regional Air Navigation Plan Volume III templates allow the Asia/Pacific Seamless Air Navigation Service (ANS) Plan to be fully incorporated into Vol. III without amendment; and (3) ensure an urgent upgrade of the electronic regional ANS Monitoring and Reporting Scheme to: (i) allow States to electronically submit data related to the Seamless ANS Plan and its subsidiary plans; and (ii) ensure the ICAO Regional Office can amend online elements, metrics and priorities, consistent with APANPIRG endorsements.	ICAO RO ICAO HQ	IOM Review implementation strategy for the 6th Edition of the GANP, consider extra resources, tools and training required for the States and resources for the ROs, take into account the Seamless ANS Plan when developing the Vol. III template, and urgently provide the necessary resources to allow an update of the monitoring system	15 November 2019 31 December 2019	Ref. T 3/10.0 – AP122/19 (ATM) dated 14 November 2019 IOM: Ref.: T 3/10.0 - AP-ATM00152/19 dated 06 December 2019 COMPLETED	To note and request Secretariat to investigate further the issue of Implementation of Regional Air Navigation Plans with the purpose to include it as a common challenge with more concrete actions in the next consolidated report to Council on PIRGs and RASGs (ref. 2.15)

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/7 **A & B**	**Asia-Pacific ATM Performance Measurement Framework**	That, States are urged to consider: 1. analysing the Asia/Pacific ATM Performance Measurement Framework (ATM PFM) at **Appendix C to the Report on Agenda Item 3.2**; 2. tailoring the ATM/PFM according to their own conditions, as appropriate; 3. promoting the ATM PFM through encouraging the stakeholders to initiate their own performance measurement practice; 4. when time and condition permit, publish a report, supporting the initiative to conduct a trial of the first phase for the initial performance measurement work; and 5. the means by which to guide the stakeholders to perform analysis and manage improvement internally, for example, develop a comprehensive information demonstration platform for performance measurement to gather data, display outcomes with computerised support tools and technology documents as appropriate.	ICAO RO APAC States and Administrations	Upload ATM PFM to the website; State Letter Review the ATM PFM, consider implementation and reporting, and the means by which a demonstration platform can be developed so this can be suggested to the ATM/SG/8.	15 November 2019 July 2020	Ref. T 3/10.0 – AP122/19 (ATM) dated 14 November 2019 COMPLETED	
C 30/8 **A & B**	**Recovery of Lost Revenue due to Airspace Closure**	That, concerned States are urged to carefully consider enacting any ANS pricing changes aimed at recovering revenue lost during the 2019 Pakistan airspace closure. Should any States be considering such a move the meeting urges those States to enter into full and transparent consultations with airspace users and their representative bodies in accordance with ICAO Doc 9082 prior to any decisions being made.	ICAO RO APAC States and Administrations	State Letter Note the principle and Doc 9082 expectations established	15 November 2019 As soon as practicable	Ref. T 3/10.0 – AP123/19 (ATM) dated 14 November 2019 COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
D 30/9 **A & B**	**Dissolution of the APUAS/TF**	That, noting that the APUAS/TF has met its objective, and any residual tasks had been reassigned to the Secretariat, the APUAS/TF be dissolved.	ICAO RO	State Letter	15 November 2019	Ref. T 3/10.0, T 3/8.13.1, T 3/10.1.26 – AP124/19 (ATM) dated 14 November 2019 COMPLETED	
C 30/10 **A & B**	**Ballistic Launch and Space Re-Entry Notification and Response**	That, States are urged to: 1. Comply with Asia/Pacific Seamless ANS Plan provisions for advance notification of ballistic launch and space re-entry activities; 2. Ensure that, in addition to the coordination specified in Annex 11, and in the Asia/Pacific Seamless ANS Plan, all notifications for ballistic launch and space re-entry are addressed to: a) the ATC Centres in Charge of all affected Flight Information Regions; and b) the International NOTAM Office of all affected Flight Information Regions; and 3. Ensure that NOTAMs are promulgated and tactical coordination undertaken for the management of affected airspace and traffic, immediately on receipt of notification from another State, and on receipt of any notification of changes or cancellation.	ICAO RO APAC States and Administrations	State Letter Note and comply with the regional expectations established	15 November 2019 As soon as practicable	Ref. T 3/10.0 – AP123/19 (ATM) dated 14 November 2019 COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
D 30/11 **A & B**	**Amend FIT-Asia Terms of Reference**	That, the amended FIT-Asia Terms of Reference in **Appendix A to the Report on Agenda Item 3.3** be adopted.	ICAO RO APAC States and Administrations	State Letter To note the ToR amendment	15 November 2019 As soon as practicable	Ref. T 3/10.0, T 3/8.13.1, T 3/10.1.26 – AP124/19 (ATM) dated 14 November 2019 COMPLETED	
C 30/12 **A & B**	**Asia/Pacific Regional FIXM Extension for ATFM**	That, noting: 1. the need for interoperable system-to-system information exchange to support the implementation and automation of cross-border ATFM in the Asia/Pacific Region; and 2. the data attributes included in the Asia/Pacific FIXM version 4.1 Extension were endorsed by ATFM/SG. The Asia/Pacific FIXM version 4.1 Extension described and provided in **Appendix A** to the Report on agenda item 3.4 be adopted and uploaded to the ICAO APAC Regional Office website for immediate use by Asia/Pacific Administrations, where the capability to do so exists, for cross-border ATFM information exchange.	ICAO APAC RO APAC States and Administrations	State Letter Action in accordance with the Conclusion	20 December 2019	Ref.: T 8/2.10 – AP140/19 (CNS) 18 December 2019 COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/13 **A & B**	**Direct controller-pilot communication SATVOICE Trials**	That, States who are interested in direct controller-pilot communication (DCPC) SATVOICE services are encouraged to conduct DCPC SATVOICE trials to verify its performance.	ICAO APAC RO APAC States and Administrations	State Letter Action in accordance with the Conclusion	20 December 2019	Ref.: T 8/4.13 – AP141/19 (CNS) 18 December 2019 IN PROGRESS	To note developments related to potential performance of new generation satellite voice communications (SATVOICE) that could achieve better Required Communication Performance (RCP) standards than the current RCP 400/Vro.

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/14 **A & B**	**Asia/Pacific Regional Transition Plan for RNP APCH Chart Identification from RNAV to RNP**	Considering ICAO provided a guidance and template on transition planning for RNP approach chart identification, That, a) The Asia/Pacific Regional Transition Plan for RNP APCH Chart Identification from RNAV to RNP in **Appendix B** to the Report on Agenda Item 3.4 be adopted as a regional plan for RNP APCH chart identification transition; b) ICAO Regional Office coordinate with ICAO PBN Programme Office for the inclusion of the plan in the Global Dashboard for the progress monitoring; c) ICAO PBN Program Office to confirm that a global contingency plan has been developed and coordinated with all Regional Offices and with the major data houses; d) ICAO PBN Programme Office to provide an updated version of the Asia/Pacific Regional Transition Plan for RNP APCH Chart Identification from RNAV to RNP to ICAO Regional Office; e) ICAO Regional Office to publish the plan on the ICAO Regional Office website; and f) States develop their transition plan and implement the chart identification transition according to their designated slots.	ICAO APAC RO APAC States and Administrations	State Letter Action in accordance with the Conclusion	6 December 2019	Ref.: T 8/4.14 – AP125/19 (CNS) 13 November 2019 IN PROGRESS	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/15 **A & B**	**Revised Surveillance Strategy for the APAC Region**	That, the Revised Surveillance Strategy for the APAC Region provided in **Appendix D** to the Report under agenda item 3.4 be adopted.	ICAO APAC RO	Posted on APAC Website and State letter to notify States	6 December 2019	Ref.: T 8/5.1 – AP135/19 (CNS) 11 December 2019 COMPLETED	
D 30/16 **A & B**	**Updated terms of reference and work plan of MET SG**	That, APANPIRG approves the updated terms of reference and work plan of MET SG at **Appendix A** to the APANPIRG/30 Report on Agenda Item 3.5.	ICAO	MET SG ToR published in updated APANPIRG Procedural Handbook	On Council's approval of proposed updates to APANPIRG ToR/ Procedural Handbook	COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/17 **A & B**	**Implementation of IWXXM**	That, all Member States/Administrations: a) Arrange for the dissemination of the required meteorological information in IWXXM GML form, in accordance with Amendment 78 to Annex 3; b) Implement only Version 3 of IWXXM for the exchange of the required meteorological information on operational networks from 5 November 2020; c) Implement Air Traffic Services (ATS) Message Handling System (AMHS), with File Transfer Body Part (FTBP) the Interpersonal Message (IPM) Heading Extension (IHE) to support the exchange of IWXXM, including support for IWXXM reports of a maximum size of 4MB and FTBP of maximum 2MB; d) Ensure there is adequate capacity in the operational AFS links to support the exchange of the required meteorological information in both IWXXM GML form and TAC from; e) Consider putting in necessary protection against cyber security, and f) Implement the necessary changes (above) as a priority at the APAC ROCs and RODBs.	ICAO States and Administrations	State letter Implementation of: a) SARPs related to IWXXM; b) IWXXM V3 (or later); c) AMHS with FTBP/IHE supporting IWXXM messages <= 4MB and FTBP <= 2MB; d) AFS links supporting MET in IWXXM and TAC form; e) Cyber risk management (for IWXXM); and f) National plans for IWXXM readiness at ROCs/RODBs	November 2019	SL Ref: AN 3/3 – AP095/20 (MET) dated 28/04/2020 Implementation by States ongoing Note: MET SG/24 has formulated an updated Draft Conclusion on the same matter for adoption by APANPIRG/31 COMPLETED	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date	Status [As of 4 December 2020]	Action by ANC [AN-WP/9399 dated 6 March 2020]
C 30/18 **A & B**	**Discontinuation of meteorological information in TAC form**	That, ICAO urges States to consider necessary changes to migrate systems to enable the use of meteorological information in XML/GML (IWXXM) form, as an alternate to meteorological information in traditional alpha-numeric code (TAC) form, and prepare for consequential impacts to aviation meteorological services such as VOLMET broadcast, weather briefing system and flight documentation preparation system.	ICAO States and Administrations	State letter State plans for discontinuation of MET exchange in TAC form	November 2019	SL Ref: AN 3/3 – AP095/20 (MET) dated 28/04/2020 COMPLETED State plans for discontinuation of MET exchange in TAC form in progress.	
C 30/19 **A & B**	**Update of information in APANPIRG Air Navigation Deficiencies Reporting Form**	That, States/Administrations be urged to: a) establish action plan with defined target dates for resolution of deficiencies, update the status on the corrective action taken and report progress in the Reporting Form of Air Navigation Deficiencies identified in ATM/AIM/SAR, AOP, CNS and MET fields as detailed in Appendices A to D to the Report on Agenda Item 4; and b) update contact details of a Focal Point to coordinate actions to resolve the Deficiencies.	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion.	30 November 2019 As soon as practicable and in periodic basis.	Ref.: AN 3/3 – AP133/19 (AGA) dated 29 November 2019 COMPLETED	

— END —

Status of Outstanding Conclusions/Decisions up to APANPIRG 29 – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 04 Dec. 2020	Action by ANC
C 28/19 A & B	**Amendment of the Management Service Agreement for CRV project (RAS14801)**	Recognizing that ICAO Technical Cooperation Bureau satisfactorily completed all the defined work items in the initial Management Service Agreement (MSA) and Project Document of RAS14801, that the required payments were settled, and that in end 2016, all the requirements of both parties have been fully completed and closed on record, That, i) all Pioneer States are encouraged to counter-sign the amended Pro Document provided in **Appendix D** to the Report on Agenda Item 3.4; 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.	ICAO APAC APAC States CRV Pioneer States	State Letter with Implementation GM Action in accordance with the Conclusion	October 2017 31 March 2018 10 May 2019 23 April 2020 (During AFSSP WG 2020) AFSSP WG2020 postponed to 2021 **July 2020**	**Concrete proposal for implementation was followed up by CRV OG/6.** **Contacts with Administrations concerned.** **Decision CRV OG/6/3: the balance of MSA to be used for an independent assessment on the safety and security of the CRV.** **CRV OG chair (Asia) to finalize a scope of work to address the agreed use of the funds in coordination with ICAO TCB through ICAO APAC Office.** **CRV OG chair (Asia) resigned from Airservices, task is pending for further discussion with TCB in next CRV OG meeting in mid 2021** **ONGOING**	

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 04 Dec. 2020	Action by ANC
C 28/25 **A & B**	**Regional Supplementary Procedures for ADS-B Operation**	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 on Agenda Item 3.4; 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.	ICAO APAC	State Letter (circulation of Proposal for Amendment of the Regional Supplementary Procedure (SUPP Doc 7030)) with Implementation GM	October 2017	The approved PfAs were circulated to States on **18 June 2020** through a State Letter with reference: T8/11.2 – AP130/20 (CNS), **COMPLETED**	
C 28/28 **A & B**	**Proposal for Amendment of the common Air Navigation Plan Template, Volume I and Volume II, Part V – MET**	That, the proposed amendments at **Appendix B to the Report on Agenda Item 3.5** concerning the "General regional requirements" in Volume I and Volume II, "Specific regional requirements" in Volume II and "Explanation of the table" in Volume II, Table MET II-2, be forwarded to the ICAO Air Navigation Plan working group (ANP WG) for further consideration in the context of developing improvements of a global nature to the common ANP template for use by all ICAO Regions.	ICAO APAC	IOM to ICAO HQ	October 2017	**COMPLETED**	

— END —

Agenda Item 1C: ICAO APAC COVID-19 Contingency and Recovery Planning Group (ACCRPG) Activities

ICAO APAC COVID-19 Contingency and Recovery Planning Group (ACCRPG) Activities (WP/06)

1C.1 APANPIRG/31 noted the progress report of the ICAO APAC COVID-19 Contingency and Recovery Planning Group (ACCRPG) activities. The Meeting also noted that, in order to focus its inter-plenary work on specific CART Recommendations, ACCRPG was established with three sub-groups: (1) aviation safety-related measures sub-group, (2) aviation public health-related measures sub-group; and (3) aviation security- and facilitation-related measures sub-group.

1C.2 APANPIRG/31 noted with interest that the ACCRPG provided 11 recommendations in the initial report and 5 additional recommendations in the second progress report to help all APAC States to prioritise the key actions they should implement to reduce the risks to passengers, aviation staff and the community of COVID-19.

1C.3 APANPIRG/31 encouraged States to participate directly in the meetings of the ACCRPG and its sub-groups nominating their focal points to the ICAO APAC Office. The Meeting also encouraged States to report progress on the implementation of the CART Recommendations (Phase I and II) and Take-off Guidance (2nd Edition) through the ICAO COVID-19 Response and Recovery Implementation Centre (CRRIC).

CANSO COVID-19 Relayed Activities in support of ATM (WP/16)

1C.4 APANPIRG/31 noted information provided by CANSO describing some of its COVID-19-related activities in support of Air Traffic Management (ATM). These included its guidance publications such as the CANSO COVID-19: ANS Restart and Recovery Guide and its industry partnerships that provided ANSPs with complimentary ATM traffic analysis reports, traffic demand prediction tools, as well as ATC simulator support.

1C.5 The paper also discussed the potential impact of the pandemic on ANSPs in the planning and provision of air navigation services by drawing on survey results in a CANSO/Industry webinar. It noted that while the priorities of ANSPs had shifted and cost cutting was now the number one priority, there were opportunities for ANSPs to "build back better" by reviewing airspace restrictions and improving service provision to minimise operational delays and inefficient routings. New operating models were needed to facilitate greater collaboration and partnerships to share risks and to increase digitization and automation for improved efficiency, flexibility, scalability and resilience.

1C.6 In recognizing the work and activities CANSO had undertaken, the Meeting noted that ANSPs, while different than airlines and airports, were subject to similarly daunting challenges. It was highlighted that the emphasis must be on collaboration and cooperation among all stakeholders.

ATM Contingency Measures and Recovery during COVID-19 (WP/17)

1C.7 Indonesia informed the Meeting of ATM contingency measures and risk reduction activities related to the COVID-19 pandemic, based on recommendations of the ICAO CART. The measures introduced included special arrangements for public health emergencies, operational arrangements through staff rostering and capacity, daily operational coordination and reporting, innovations in ANS to stimulate traffic growth and enhance operational efficiency, and coordination

with Australia to share information on operational contingency procedures. Indonesia had internally discussed CART recommendations and reported their progress on all 11 recommendations through the CRRIC portal.

1C.8 In response to Indonesia's recommendation that ICAO support States in the development of guidance materials for safety management (CART Recommendation 3 refers) and restarting operations, APANPIRG/31 noted that ICAO had developed Implementation Packages (iPACKs) in Aviation Safety Risks Management related to COVID-19 for CAAs and Aerodrome Restart, and would develop iPACKs in other relevant areas, providing States with guidance, standardized training and other useful materials.

1C.9 IATA recognized the efforts of Indonesia, and of other States including but not limited to Australia, India, Japan and United States, in engaging with operators and implementing operational improvements supporting airline operations affected by the COVID-19 pandemic. It was to be hoped that these improvements would continue to be applied post-pandemic, to assist the industry to come out of the current situation in better shape than it went in.

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Agenda Item 1D: Aviation Safety and RASG-APAC Activities

Report of the Seventh Regional Coordination Meeting of PIRG and RASG (WP/07)

1D.1 APANPIRG/31 reviewed the Report of the Seventh Coordination Meeting of APANPIRG and RASG–APAC held via video teleconference on 4 May 2020. APANPIRG/31 noted the outcomes of the Coordination Meeting which were summarized in the **Attachment** to WP/07.

1D.2 APANPIRG/31 noted with interest that the Coordination Meeting added *proactive action to minimize the effect of public health crisis, such as COVID-19, to air transport* as an item requiring coordination among PIRG, RASG and CAPSCA, and in accordance with the guidance from ICAO Headquarters.

1D.3 APANPIRG/31 also noted that, as per the Lead Regional Group table shown in WP/07, matters related to runway safety would be led by APANPIRG (and its Aerodromes Operations and Planning Sub-group) with appropriate coordination with RASG-APAC.

RASG/9 and APRAST/15 Meeting Outcomes (WP/08)

1D.4 APANPIRG/31 meeting noted the activities undertaken by the RASG-APAC and APRAST in 2019/2020. The meeting also noted that outcomes of APRAST/15 meeting held on 24 – 25 June 2020 via video teleconference, and RASG-APAC/9 meeting held on 7 – 8 November 2019 in Bangkok, Thailand.

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Agenda Item 2: Global and Inter Regional Activities

Recent Developments of Interest (IP/02)

2.1.1 APANPIRG/31 noted updates provided by the Secretariat regarding (1) recent changes in the conduct of USOAP CMA and planning for 2021, (2) delayed GANP Blocks, (3) runway safety programme, GRF and SNOWTAM, and (4) Trust Framework.

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Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.0 Regional and National Performance Framework

Implementation of Performance Measurement in Asia Pacific (WP/18)

3.0.1 Singapore reminded the meeting of the APANPIRG/30-endorsed *Asia/Pacific Air Traffic Management Performance Measurement Framework (ATM PMF)*, noting the 10 Stage 1 Key Performance Indicators (KPIs), of which eight were aligned with the ICAO Global Air Navigation Plan (GANP). In view of the benefits gained by the tracking of operational KPIs, Singapore recommended that APAC States start to monitor the eight GANP-aligned Stage 1 KPIs, implementing in a stepwise manner by first identifying data of specific interest (e.g. major airports) and, thereafter, State-wide.

3.0.2 During discussion, it was observed that the pandemic-reduced traffic environment presented a good opportunity for States to start collecting and processing performance data, with a view to moving to the use of empirical, quantitative data to support investment decisions. The Chair noted that China, Japan, Thailand, United States, CANSO and IATA had spoken in support of Singapore's recommendation, and urged States that had not yet commenced this work to do so expeditiously.

3.0.3 ICAO recalled that **Conclusion APANPIRG/30/7** had, in addition to adopting the ATM PMF, already urged States to consider actions to analyse, tailor and promote the ATM PMF, trial the first phase for the initial performance measurement work, and guide stakeholders to perform analysis and manage improvement using the ATM PMF.

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Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.1 AOP

Report on the Fourth Meeting of AOP Sub Group (WP/09)

History of the Meeting

3.1.1 The Fourth Meeting of the Aerodrome Operations and Planning Sub Group (AOP/SG/4) was held from 10 to 13 November 2020 as a video teleconference.

3.1.2 Based on the outcome of discussions, the AOP/SG/4 adopted 4 Conclusions and 3 Decisions that were of a technical or purely operational nature. The AOP/SG/4 also formulated 7 Draft Conclusions and 1 Draft Decision for further consideration by APANPIRG/31.

Asia/Pacific Air Navigation Plan (ANP)

3.1.3 Recognizing that many aerodromes used for international operations or aerodromes under construction or planned for international operations in Asia/Pacific Region were not included in APAC ANP Volume I, Table AOP I-1 and ANP Volume II, Table AOP II-1, and considering that information included in Tables AOP I-1 and Table AOP II-1 are accurate and current for regional planning of the other air navigation services, APANPIRG/31 recalled that the AOP/SG/3 adopted a Conclusion reproduced below:

> **Conclusion AOP/SG/3–1:** Proposal for Amendment of Asia/Pacific ANP Volume I, Table AOP I-1 and ANP Volume II, Table AOP II-1
>
> That, many aerodromes used for international operations or aerodromes under construction or planned for international operations in Asia/Pacific Region were not included in APAC ANP Volume I, Table AOP I-1 and ANP Volume II, Table AOP II-1. It is also important that information included in Tables AOP I-1 and Table AOP II-1 are accurate and current for regional planning of the other air navigation services.
>
> States are urged to:
>
> a) review the aerodromes listed in **APAC ANP Volume I, Table AOP I-1**;
>
> b) review the **ANP Volume II, Table AOP II-1** for the list of facilities and services to be provided by the State concerned at each aerodrome that is listed in **Table AOP I-1**;
>
> c) initiate and send to ICAO APAC Office proposals for amendment of **APAC ANP Volume I, Table AOP I-1** and **ANP Volume II, Table AOP II-1** in accordance with the template provided in **Appendix A** to the AOP/SG/3 Report, if their international aerodromes are not listed in **Table AOP I-1** or require any amendments to update the information provided in **Tables AOP I-1 and AOP II-1**

3.1.4 Further to Conclusion AOP/SG/3–1, the APANPIRG/31 Meeting urged States to provide information related to international aerodromes to update *Table AOP I-1: International Aerodromes required in the Asia/Pacific Regions* and *Table AOP II-1: Requirements and Capacity Assessment in International Aerodromes in the Asia and Pacific Regions* of APAC ANP Volume I and Volume II.

Report of the Fifth Meeting of the Asia Pacific Airport Collaborative Decision Making Task Force (APA-CDM/TF/5)

3.1.5 AOP/SG/4 noted that the APA-CDM/TF/5 Meeting reviewed the APA-CDM/TF Terms of Reference (TOR), which was amended by APANPIRG/30 (Bangkok, Thailand, 4 to 6 November 2019) through **Decision APANPIRG/30/3**, subsequent to an amendment proposal formulated by APA-CDM/TF/4 (Bangkok, Thailand, 22 to 26 April 2019) and endorsed by AOP/SG/3 (Bangkok, Thailand, 24 to 26 June 2019). To align the ToR with the APAC Seamless ANS Plan Version 3.0, 2019 approved by APANPIRG/30, APANPIRG/31 adopted the following Decision formulated by the APA-CDM/TF/5 and endorsed by AOP/SG/4:

<table>
<tr><td colspan="3">Decision APANPIRG/31/1 (AOP/SG/4-1 & APA-CDM/TF/5–1): Proposal for Amendment of APA-CDM/TF TOR</td></tr>
<tr><td colspan="2">What: That, the Terms of Reference (TOR) of Asia/Pacific Airport Collaborative Decision Making Task Force (APA-CDM/TF) be amended as in Appendix A to the Report on Agenda Item 3.1.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To align the TOR with the APAC Seamless ANS Plan Version 3.0.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

Report of the Fourth Meeting of the Aerodrome Operational Personnel Competency Small Working Group (AOPC/SWG42)

3.1.6 The AOPC/SWG/4 Meeting (Yangon, Myanmar, 10 – 14 February 2020) reviewed the latest draft Asia/Pacific Regional Guidance on Aerodrome Operations Personnel Competency Requirement Framework presented at the Meeting. Consolidating the AOPC Matrices developed under WP/02, the AOPC/SWG/4 Meeting updated the Draft Asia/Pacific Regional Guidance on AOPC Requirement Framework.

3.1.7 With the finalized draft, APANPIRG/31 noted that AOP/SG/4 adopted the following Conclusion formulated by AOPC/SWG/4:

Conclusion AOP/SG/4-2 (AOPC SWG/4–1): Asia/Pacific Regional Guidance on Aerodrome Operations Personnel Competency Requirement Framework

That, the Asia/Pacific Regional Guidance on Aerodrome Operations Personnel Competency Requirement Framework provided in **Appendix B** to the **AOP/SG/4** Report be adopted and published on the ICAO APAC website.

3.1.8 With the progress made during the AOPC/SWG/4 Meeting, it was determined that all tasks assigned to AOPC/SWG had been completed. APANPIRG/31 noted that AOP/SG/4 adopted the following Decision formulated by AOPC/SWG/4:

Decision AOP/SG/4-3 (AOPC SWG/4–2): Dissolution of Aerodrome Operations Personnel Competency Small Working Group

That, the Aerodrome Operations Personnel Competency Small Working Group (AOPC/SWG), having completed all tasks as per its TOR, be dissolved.

Report on the Second Meeting of the Asia/Pacific Wildlife Hazard Management Working Group (AP–WHM/WG/2)

3.1.9 In order to better facilitate occurrence reporting and data analysis, as announced in ICAO EB 2017/25, ICAO had replaced the old IBIS computer application with a new reporting system based on the European Co-ordination Centre for Accident and Incident Reporting Systems (ECCAIRS) platform. A User Manual and Software Installation Manual of ECCAIRs is available at http://www.icao.int/ibis for States interested in the platform.

3.1.10 States were requested to submit the wildlife strike reports either through ECCAIRS.e5f files, or through an ECCAIRS Excel-based form that could be downloaded at http://www.icao.int/ibis. The files should be sent to the following email addresses:

wildlife@icao.int, icaohq@icao.int, aoi@icao.int, and iaa@icao.int

3.1.11 To further enhance wildlife strike reporting by States, APANPIRG/31 adopted the following Conclusion formulated by AP-WHM/WG/2 and endorsed by AOP/SG/4:

<table>
<tr><td colspan="3">Conclusion APANPIRG/31/2 (AOP/SG/4-4 & AP–WHM WG/2–1): Submission of Wildlife Strike Reports</td></tr>
<tr><td colspan="2">What: That, States are requested to submit wildlife strike reports to ICAO in the format of either ECCAIRS.e5f files or the standard ICAO ECCAIRS Excel-based form available at http://www.icao.int/ibis.</td><td>Expected impact:
☒ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To facilitate wildlife strike occurrence reporting and data analysis</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: Nil</td></tr>
</table>

3.1.12 Presented by ACI, AP-WHM/WG/2 WP/03 delivered the major challenges in wildlife hazard management that aerodrome operators in Asia-Pacific are facing and suggested a way forward to continue to meet these challenges.

3.1.13 The challenges covered in the WP included the lack of wildlife hazard management plan, the lack of resources and training and the lack of a positive safety culture and communication. Way forward suggested in the WP included the continuation of joint ICAO/ACI seminars and symposiums, continuation of promotion of a positive safety culture, promotion of online training and continuation of cooperation in APEX in Safety.

3.1.14 The APANPIRG/31 Meeting noted that there were a number of wildlife hazard management courses available but some aerodromes still faced the problem of staff competency in their wildlife hazard management unit. It was agreed that the issue could be caused by insufficient awareness among aerodrome senior management, thus resulting in the lack of resources in the area.

3.1.15 APANPIRG/31 adopted the following Conclusions formulated by AP-WHM/WG/2 and endorsed by AOP/SG/4:

Conclusion APANPIRG/31/3 (AOP/SG/4-5 & AP–WHM WG/2–2): Wildlife Hazard Management Training		
What: That, States recognise the prioritised need for competent and trained personnel in aerodrome wildlife hazard management at regulatory and aerodrome operation levels.		Expected impact: ☒ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To reduce the risk associated to wildlife activities by the provision of competent wildlife hazard management personnel at aerodromes.	Follow-up: ☒Required from States	
When: 16-Dec-20	Status: Adopted by PIRG	
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: Nil		

Conclusion APANPIRG/31/4 (AOP/SG/4-6 & AP–WHM WG/2–3): Promotion of a Positive Safety Culture		
What: That, • States are encouraged to promote a positive safety culture in wildlife hazard management at regulatory and aerodrome operation levels; and • Reporting culture be considered in implementing aerodrome wildlife hazard management programmes.		Expected impact: ☒ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To enhance reporting on wildlife	Follow-up: ☒Required from States	
When: 16-Dec-20	Status: Adopted by PIRG	
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: Nil		

Report of the First Joint Meeting of the Asia/Pacific Aerodrome Design and Operations Task Force (AP-ADO/TF/1) and Asia/Pacific Aerodrome Assistance Working Group (AP-AA/WG/1) and the Second Meeting of Asia/Pacific Aerodrome Assistance Working Group (AP-AA/WG/2)

3.1.16 APANPIRG/31 noted that AP-AA/WG/2 developed a generic aerodrome certification procedure manual, a draft generic aerodrome inspector handbook, generic procedures for accepting non-compliance and a draft generic aerodrome manual. The AP-AA/WG/2 Meeting agreed that it would be beneficial to publish the generic documents, either finalized or in a draft state, on the ICAO APAC Office website for reference or advance information by APAC States which have been working on the certification of aerodromes for international operations. Efforts would be endeavoured to finalize the generic documents at the earliest opportunity. APANPIRG/31 noted that AOP/SG/4 adopted the following Decision formulated by AP-AA/WG/2:

Decision AOP/SG/4-7 (AP-AA/WG/2–1): Generic Documents related to Aerodrome Certification

That,

a) the generic documents in **Appendix C (Generic Aerodrome Certification Procedure) and Appendix E (Generic Procedures for Accepting Non-Compliances in Aerodromes)** to the **AOP/SG/4 Report** be made available on the ICAO APAC Office Website for the reference by States in the APAC Region; and

b) the draft generic documents in **Appendix D (Draft Generic Aerodrome Inspector Handbook) and Appendix F (Draft Generic Aerodrome Manual)** to **AOP/SG/4 Report** be made available on the ICAO APAC Office Website for the advance information by States in the APAC Region.

3.1.17 AP-AA/WG/2 was introduced with a survey questionnaire for States in APAC Region which (1) have not completed the certification of aerodromes used for international operations, (2) have AGA EI below 75%, and/or (3) are identified with AOP air navigation deficiencies to establish the requirements for assistance.

3.1.18 APANPIRG/31 noted that AOP/SG/4 adopted the following Conclusion formulated by AP-AA/WG/2:

Conclusion AOP/SG/4-8 (AP-AA/WG/2–2): Survey Questionnaire for Aerodrome Assistance in APAC States

That, the survey questionnaire in **Appendix G to AOP/SG/4 Report** be circulated to States to identify the need of aerodrome assistance among States in the APAC Regions.

3.1.19 APANPIRG/31 noted that AOP/SG/4 adopted the following Decision drafted by AP-AA/WG/2 to tally its TOR with the safety target set in the ICAO Global Aviation Safety Plan 2020-2022:

Decision AOP/SG/4-9 (AP-AA/WG/2–3): Proposal for Amendment to TOR of Asia/Pacific Aerodrome Assistance Working Group

That, the AP-AA/WG/2 Meeting agreed to propose an amendment to the TOR of AP-AA/WG as placed in **Appendix H to AOP/SG/4 Report**.

Implementation of Requirements for Certification of Aerodromes in the Asia Pacific Region

Certification of Aerodromes

3.1.20 APANPIRG/31 noted that there were **239** international aerodromes listed in Asia/Pacific Region ANP Volume I as of October 2020. However, the number of international aerodromes used for international operations in Asia/Pacific Region has increased and reached to approximately **342** based on information gathered from Doc 7910 (Location Indicator), States' Aeronautical Information Publications (AIPs), CAA / Airport Websites, flight tracking data and ICAO Missions.

3.1.21 APANPIRG/31 noted that AOP/SG/4 reviewed the list of aerodromes used for international operations in APAC region that have yet to be certified, which was prepared based on information collected from APAC States through survey questionnaire, ICAO/COSCAPs missions including ICAO USOAP audit and ICVM, and flight tracking data, and placed in **Appendix I** to the AOP/SG/4 Report.

3.1.22 APANPIRG/31 noted that Bangladesh, Philippines and Solomon Islands had each certified one aerodrome used for international operations in 2020. It was also noted that approximately 41 aerodromes (i.e. 12 %) out of 342 aerodromes used for international operations in Asia and Pacific Regions were yet to be certified.

3.1.23 The status of certified aerodromes in different Sub Regions of Asia/Pacific Region is illustrated in the Table 3.1A below:

Aerodromes	**North Asia (5 States & 2 SARs)**	**South East Asia (11 States)**	**South Asia (8 States)**	**Pacific (15 States & 8 OTs)**
Total Number of Int'l Aerodromes	134	98	52	58
Number of Certified Int'l Aerodromes	127	81	43	50
Number of Int'l Aerodromes yet to be certified	**7**	**17**	**9**	**8**
States with Int'l Aerodromes yet to be certified (number and percentage of aerodromes yet to be certified)	1) China (3, 3%) 2) Japan (4, 12%)	1) Brunei Darussalam (1, 100%), 2) Lao PDR (4, 100%) 3) Malaysia (2, 11%) 4) Philippines (3, 33%) 5) Thailand (5, 45%), 6) Timor-Leste (2, 100%)	1) Afghanistan (4, 100%) 2) India (5, 19%)	1) Kiribati (2, 100%) 2) Micronesia (Federal States of) (4, 100%), 3) Nauru (1, 100%), 4) Tuvalu (1, 100%)

Table 3.1A - Status of certified aerodromes used for international operations in Sub Regions of Asia/Pacific Region

Status of Certification of Aerodromes in AIP

3.1.24 APANPIRG/31 noted a number of States / Administrations that have yet to publish the status of certification of aerodromes in AIP AD 1.5.

3.1.25 APANPIRG/31 further noted that, subsequent to AOP/SG/4, Thailand had submitted evidence showing that its AIP AD 1.5 would contain all aerodromes used for international operations with effect from 31 December 2020. A summary is available in Table 3.1B below:

States	North Asia (5 States & 2 SARs)	South East Asia (11 States)	South Asia (8 States)	Pacific (15 States & 8 OTs)
No aerodromes listed in AD 1.5/ AD 1.5 missing in AIP	--	1) Brunei Darussalam 2) Lao PDR 3) Philippines 4) Timor Leste	1) Afghanistan	1) American Samoa (US) 2) Cook Is. 3) Guam (US) 4) Kiribati 5) Nauru 6) Niue (NZ) 7) N. Mariana Is. (US) 8) Samoa 9) Tonga 10) Tuvalu 11) Vanuatu
Some but not all aerodromes listed in AD 1.5	1) China 2) Japan	1) Malaysia 2) Viet Nam	1) India 2) Pakistan	--
Status listed but not under AD 1.5	--	--	--	1) Fiji 2) New Zealand
AIP cannot be located	--	--	--	1) Marshall Is. 2) Micronesia (Federated States of) 3) Palau 4) Solomon Is.
Total	**2 States**	**6 States**	**3 States**	**17 States / OTs**

Table 3.1B – Status of AIP AD 1.5 in Sub Regions of Asia/Pacific Region

3.1.26 APANPIRG/31 urged States and their aerodrome operators that have yet to certify aerodromes used for international operations to take an effective action on the 55th DGCA Action Item 55/42. In addition, APANPIRG/31 urged States to provide periodic updates on the progress of the certification of aerodromes and AIP AD 1.5 to the ICAO APAC Office.

Enhanced Global Reporting Format for Assessing and Reporting Runway Surface Conditions (GRF)

3.1.27 In order to assist States in tracking the implementation progress of GRF-related provisions, based on a template developed by COSCAP-SEA earlier, APANPIRG/31 noted that ICAO APAC Office prepared a GRF Implementation Action Plan Template. The template is available in **Appendix B** to Report on Agenda Item 3.1 (reproduced from **Appendix L to AOP/SG/4 Report**).

3.1.28 The template identified 15 action items and a number of action parties to facilitate States in their preparation for GRF implementation. Target dates for each action items have also been set, which States may take reference when determining their own implementation dates.

3.1.29 To maximize the benefits brought by the template, APANPIRG/31 adopted the following Conclusion endorsed by AOP/SG/4:

Conclusion APANPIRG/31/5 (AOP/SG/4–10): GRF Implementation Action Plan Template	
What: That, a) The GRF Implementation Action Plan Template contained in **Appendix B** to Report on Agenda Item 3.1 be uploaded to ICAO APAC Website for reference by States / Administrations; and b) States / Administrations are requested to make reference to the GRF Implementation Action Plan Template and submit their own action plans to ICAO APAC Office by **28 February 2021**.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: To assist States in the implementation of GRF-related SARPs and PANS.	Follow-up: ☒Required from States
When: 16-Dec-20	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Runway Safety Team (RST)

3.1.30 APANPIRG/31 noted that an aerodrome operator shall establish a Runway Safety Team (RST) comprised of relevant organizations operating or providing services on the aerodrome. The terms of reference and composition of the RST should be established and included in the aerodrome manual. Activities to be included in the terms of reference as well as the proposed composition of an RST were included in the Appendix to the Chapter 8 of Part II of PANS-Aerodromes (Doc 9981).

3.1.31 APANPIRG/31 also noted that ICAO has been maintaining a RST Survey to keep track of the establishment of RSTs at aerodromes used for international operations. The survey results and questionnaire were available at the following URL:

https://www.icao.int/safety/RunwaySafety/Pages/Runway%20Safety%20Team%20Register.aspx

3.1.32 Considering the importance of RST, APANPIRG/31 adopted the following Conclusion endorsed by AOP/SG/4:

Conclusion APANPIRG/31/6 (AOP/SG/4–11): Runway Safety Team	
What: That, States/Administrations to urge operators of aerodromes used for international operations to: a) establish runway safety teams (RSTs) in accordance with PANS-Aerodromes (Doc 9981) and ICAO RST Handbook; and b) participate in the ICAO RST Survey to register their RSTs.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: To promote and keep track of the establishment of RSTs among aerodromes used for international operations to enhance runway safety.	Follow-up: ☒Required from States
When: 16-Dec-20	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Regional Guidance on Aeronautical Information Publication – AD 1.5 Status of Certification of Aerodromes

3.1.33 APANPIRG/31 recalled **Conclusion APANPIRG/30/4** which, inter alia, urged States that have not published the status of certification of aerodromes in State's AIP to publish the status as soon as possible in accordance with Annex 14 Vol I (para. 2.13.1), PANS-Aerodromes (para. 2.3.7) and Appendix 2 to PANS-AIM (Doc 10066); and agreed that if any States fails to publish the status of certification of aerodromes in State's AIP by December 2019 will be subject to being included on the APANPIRG AOP Air Navigation Deficiency list against ICAO Annex 14 para. 2.13.1 a), PANS-Aerodromes, para. 2.3.7 and Appendix 2 to PANS-AIM.

3.1.34 Since the adoption of the **Conclusion APANPIRG/30/4**, ICAO APAC Office received queries from a number of States requesting for clarification on the content to be published in AIP AD 1.5. As a result, a regional guidance on AIP AD 1.5 had been drafted to supplement the aforementioned ICAO provisions and provide detailed guidance to States / Administrations.

3.1.35 APANPIRG/31 noted that AOP/SG/4 adopted the following Conclusion:

Conclusion AOP/SG/4–12: Regional Guidance on Aeronautical Information Publication – AD 1.5 Status of Certification of Aerodromes

That, the *Regional Guidance on Aeronautical Information Publication – AD 1.5 Status of Certification of Aerodromes* provided in **Appendix M to AOP/SG/4 Report** be adopted and published on the ICAO APAC website.

Alphanumeric Call Sign Initiative

3.1.36 With regard to ATC 'loop error' LHD events, Japan had provided a detailed analysis to the Twenty-Fifth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/25, video teleconference, 27-30 October 2020) meeting regarding of these incidents were due to similar call signs.

3.1.37 In response to a query from ICAO, IATA clarified that its successful similar call sign initiative that had been implemented in the Middle East (MID) Region had not been able to progress in the Asia/Pacific (APAC) Region. AOP/SG/4 noted that one of the reasons for this had been the reluctance of aerodrome operators to implement change until an automated tool was available to accommodate alphanumeric call signs.

3.1.38 Noting the grave safety risks from such occurrences, APANPIRG/31 noted that AOP/SG/4 reviewed and endorsed the following Draft Conclusion formulated by RASMAG/25. The Draft Conclusion was also endorsed by ATM/SG/8 subsequently (Please refer to Report on Agenda Item 3.2.).

Draft Conclusion RASMAG/25-3: Alphanumeric Call Sign Initiative

Noting:

1) the extreme safety risks associated with pilot-ATC miscommunication and the number of Category D (ATC Loop Error) Large Height Deviations (LHDs);

2) APANPIRG Conclusion 27/15. ATMSG Conclusions 5-5 and 5-6 regarding the Asia Pacific Alpha Numeric Call-Sign (ANCS) call sign project; and

3) alphanumeric call signs were a well-established call sign confusion mitigation, that:

leading Air Navigation Service Providers (ANSPs) and aerodrome operators, in coordination with CANSO and ACI, were urged to consider a trial to identify and overcome any barriers for the implementation of alphanumeric call signs, with a view to developing a project for the Asia/Pacific (APAC) Region.

Runway with Holding Bays or Multiple Entrance Taxiways

3.1.39 APANPIRG/31 noted the following issues brought up during AOP/SG/4: (a) a figure in ICAO Aerodrome Design Manual, Part 2 did not tally with Annex 14, Volume I SARPs and the actual aircraft operation; and (b) the possibility of aircraft ground collision when a runway was equipped with holding bay or multiple entrance taxiways and when an aircraft was passing behind another aircraft holding short of runway.

3.1.40 In addition to the consideration raised in WP/24, jet blast effect should also be taken into account especially for scenarios where small aircraft were involved.

3.1.41 To further address the matters, APANPIRG/31 adopted the following Conclusion endorsed by AOP/SG/4:

Conclusion APANPIRG/31/7 (AOP/SG/4–13): Holding Bays and Multiple Entrance Taxiways	
What: That, the ICAO HQ be invited to consider to: a) Review Figure 2-2 of ICAO Aerodrome Design Manual (Doc 9157), Part 2 *Taxiways, Aprons and Holding Bays* to tally with SARPs of runway-holding position marking and actual aircraft operations; and b) Review the current SARPs in Annex 14, *Aerodromes* – Volume I, *Aerodrome Design and Operations* to cater for the design of multiple entrance taxiways.	Expected impact: ☒ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To tally a figure in ICAO guidance material with the applicable SARPs and to enhance aircraft safety	Follow-up: ☐Required from States
When: 16-Dec-20	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☒ICAO HQ ☐Other:	

Alternative Safety Oversight Framework for Military Aerodromes Undertaking Limited Civil International Operations

3.1.42 APANPIRG/31 noted that, in APAC Region, there were a number of military aerodromes designated as alternates for international flights or receiving international flights on a limited scale and / or ad hoc basis. AOP/SG/4 discussed a proposed way forward for the safety oversight of those military aerodromes in Australia undertaking the aforementioned operations.

3.1.43 Instead of going through an aerodrome certification exercise, it was proposed Australian Civil Aviation Safety Authority (CASA) and the Defence Aviation Safety Authority (DASA) agree on an appropriate written framework to ensure there is effective safety oversight of those military aerodromes undertaking limited civil international operations. This was to be commensurate with the current and future expected level of international civil operations at said aerodromes.

3.1.44 Military aerodromes undertaking limited civil international operations would include those (1) designated as alternates for international flights; and (2) used for international operations on a limited scale and on an ad hoc basis. "Limited scale" would refer to a tiny and insignificant amount of flights when compared to the overall traffic volume of that State, the military aerodrome and a civil aerodrome used for international operations in that State. "Ad hoc" would refer to that the international flights are sporadic and irregular in nature.

3.1.45 The aerodromes in question would be required to comply with the ICAO SARPs, procedures, and other relevant guidance material as much as practicable. In addition, aerodrome users would be informed of this alternate safety framework at AIP AD 1.5.

3.1.46 Singapore supported Draft Conclusion AOP/SG/4/14 (adopted by APANPIRG/31 as **Conclusion APANPIRG/31/8**, see the following paragraph), as it would be useful to have an alternative safety oversight framework since the certification of military aerodromes undertaking limited civil international operations might prove challenging.

3.1.47 APANPIRG/31 agreed to the consideration of AOP/SG/4 that the proposed alternative safety oversight framework for military aerodromes undertaking limited civil international operations in Australia might be a practical solution for other States, where the certification of such aerodromes by civil aviation authorities might prove difficult and, considering the limited presence of civil international flights, an alternative safety oversight framework could be adopted. As such, APANPIRG/31 adopted the following Conclusion endorsed by AOP/SG/4:

<table>
<tr><td colspan="3">Conclusion APANPIRG/31/8 (AOP/SG/4–14): Alternative Safety Oversight Framework for Military Aerodromes undertaking Limited Civil International Operations</td></tr>
<tr><td colspan="2">What: That, recognizing:
(1) certain military aerodromes in States are undertaking limited civil international operations;
(2) certification of such aerodromes by civil aviation authorities may prove difficult; and
(3) an alternative safety oversight framework may be appropriate in consideration of the low level of civil international operations at such aerodromes;
ICAO HQ is invited to consider establishing an alternative safety oversight framework in lieu of certification for such military aerodromes.</td><td>Expected impact:
☒ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To provide an alternative safety oversight framework for military aerodromes undertaking limited civil international operations.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

Status of Air Navigation Deficiencies in AOP Field

3.1.48 AOP/SG/4 reviewed the list of Air Navigation Deficiencies noted by APANPIRG/30 in the AOP field. Brunei Darussalam**,** India, Mongolia, Myanmar, Nepal, Thailand and Viet Nam provided updates on the status of their Deficiencies.

3.1.49 In connection with **Conclusion APANPIRG/30/4: Certification of aerodromes used for international operations in Asia Pacific States**, the States / Administrations / aerodromes identified in **Appendix I** to AOP/SG/4 Report would be included in the APANPIRG AOP Deficiency List after review and endorsement by APANPIRG/31, with effect from 1 January 2021.

3.1.50 APANPIRG/31 noted that AOP/SG/4 received the following verbal updates from States:

States	Updates
Australia	AIP Australia had incorporated AD 1.5 since 5 November 2020, pointing readers to *En Route Supplement Australia* (ERSA) for the status of certification of aerodromes.
India	There had been difficulties in certifying military / joint-use aerodromes. India was looking forward to guidance from ICAO on the matter. (See **Draft Conclusion AOP/SG/4-14** for details.)
Japan	On the military / joint-use aerodromes, Japan had been facing difficulties similar to India, and would like to have further guidance from ICAO.
Lao PDR	Updates would be provided to ICAO APAC Office after the meeting.
Nepal	Nepal reported the progress of the corrective action plans stated in the Air Navigation Deficiency List.
United States	The AIP issue for the US Territories would be examined by FAA.

3.1.51 Australia provided written evidence to the Secretariat during the course of AOP/SG/4. The evidence was considered adequate and the proposed Air Navigation Deficiency entry under Australia was removed.

3.1.52 APANPIRG/31 noted that, subsequent to AOP/SG/4, Bangladesh and Philippines provided written evidence about the certification of Sylhet/VGSY and Manila/RPLL respectively. Therefore, the two aerodromes were not included in the Air Navigation Deficiency List.

3.1.53 APANPIRG/31 further noted that, subsequent to AOP/SG/4, Thailand had submitted evidence showing that its AIP AD 1.5 would contain all aerodromes used for international operations with effect from 31 December 2020. Therefore, Thailand would not be included in the Air Navigation Deficiency List with respect to publication of the status of certification of aerodromes in AIP AD 1.5.

3.1.54 The list of Deficiencies placed in **Appendix N to AOP/SG/4 Report** was further updated based on the above considerations (paragraphs 3.1.50 to 3.1.52 refers), and considered by APANPIRG/31 under Agenda Item 4 (Appendix B to the Report on Agenda Item 4 refers).

3.1.55 AOP/SG/4 noted the note provided under Conclusion APANPIRG/29/27 and reproduced below:

> *Note: In case States provide satisfactory evidence to the APAC Office for the resolution of the deficiencies, the APAC Office in consultation with the Chair of respective Sub Group and subsequent approval from Chairman of APANPIRG may take action to remove the deficiency from APANPIRG open deficiency list.*

3.1.56 Based on the previous communications with and participation in AOP/SG meetings from States / Administrations, ICAO APAC Office prepared a list of AOP Focal Points in **Appendix O to AOP/SG/4 Report**. The list would allow effective and efficient communications between States / Administrations and ICAO APAC Office on AOP matters, including but not limited to the resolution of Air Navigation Deficiencies in the AOP field.

3.1.57 APANPIRG/31 noted that AOP/SG/4 adopted the following Conclusion:

Conclusion AOP/SG/4–15: AOP Focal Points

That, States / Administrations be urged to review and update contact details of AOP Focal Points, as contained in **Appendix O to AOP/SG/4 Report**, for the coordination of actions to resolve the APANPIRG Air Navigation Deficiencies in the AOP Field and for other AOP matters.

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Asia/Pacific Airport Collaborative Decision-Making Task Force (APA-CDM/TF)

TERMS OF REFERENCE

~~(As amended by **Decision APANPIRG/30/3**)~~
(Proposed Amendment by APA-CDM/TF/5 and approved by APANPIRG/31)

The scope and objective of the APA-CDM/TF is to assist States in implementation of A-CDM at ~~high density~~ international aerodromes ~~(100,000 scheduled movements per annum or more as per Asia/Pacific Seamless ATM Plan)~~ by fostering harmonized A-CDM implementations and promoting best practices to achieve performance expectations as per Asia/Pacific A-CDM Implementation Plan.

To achieve the above objective, the Task Force shall:

1) Monitor and assist States in implementation of A-CDM at ~~high density~~ international aerodromes to foster harmonized implementations as per Asia/Pacific A-CDM Implementation Plan;

2) Encourage States to share their experiences and best practices in implementing A-CDM through Workshop /Seminar;

3) Monitor the progress of achieving the performance expectations as per Asia/Pacific A-CDM Implementation Plan and review them as needed;

4) Foster the interoperability of A-CDM with ATFM and Aircraft Operator systems; and

5) Establish and continue close working arrangements with other relevant ICAO Regional groups such as the Air Traffic Flow Management Steering Group (ATFM/SG), System-Wide Information Management Task Force (SWIM/TF) and other groups working on related issues.

Composition: The APA-CDM Task Force will be a multidisciplinary group composed of subject matter experts in aircraft operations, air traffic management, aerodrome operations and systems engineering, supplemented with other members as and when required.

Working Methods: The Task Force will hold at least one three-day face-to-face meeting each year.

Time Lines: Deliverables addressing the objective of the Task Force are required to be developed and delivered to APANPIRG/32.

ICAO

NEW ICAO METHODOLOGY FOR ASSESSING AND REPORTING RUNWAY SURFACE CONDITIONS (GRF)

IMPLEMENTATION ACTION PLAN TEMPLATE[1]

_____ [Insert name of State]

ID	ACTION	ENTITY RESPONSIBLE	TARGET DATE[2]	IMPLEMENTATION DATE[3]	REMARKS[3]
GRF 1	Review ICAO provisions and guidance and other Organisations guidance (see References)	CAA	31/12/2020		
GRF 2	Designate a focal point to coordinate implementation activities at the national level	CAA	31/12/2020		
GRF 3	Identify concerned focal points in each entity (CAA, Airport, ANSP, Aircraft operators – include BA, GA and military as applicable)	CAA, Airports, ANSP, Aircraft operators	31/12/2020		
GRF 4	Establish an Implementation Coordination Team including staff from the identified stakeholder entities	CAA	15/01/2021		
GRF 5	Conduct the initial training for the CAA, Airports, ANSP and Aircraft Operators' personnel (e.g. ICAO/ACI/IATA online courses, national awareness workshop, etc.)	CAA	01/03/2021		
GRF 6	Identify regulations, standards, procedures and guidance material to be developed/amended	National Focal Point and the Implementation Coordination Team	01/04/2021		
GRF 7	Develop a detailed national implementation plan and safety risk assessment. Each entity should also establish its specific implementation plan and safety risk assessment.	CAA, Airports, ANSP, Aircraft operators	01/04/2021		
GRF 8	Identify the necessary means and resources for the implementation (human, financial and material resources)	National Focal Point and the Implementation Coordination Team	01/04/2021		
GRF 9	Consult with Airport Runway Safety Teams	Airports	14/05/2021		
GRF 10	Develop and promulgate regulations and standards	CAA	14/05/2021		
GRF 11	Develop procedures and guidance material (translate if required)	National Focal Point and the Implementation Coordination Team	15/06/2021		

ID	ACTION	ENTITY RESPONSIBLE	TARGET DATE[2]	IMPLEMENTATION DATE[3]	REMARKS[3]
GRF 12	Provide the necessary means and resources for the implementation (human, financial and material resources)	CAA, Airports, ANSP, Aircraft operators	30/06/2021		
GRF 13	Conduct On-the-Job Training (OJT) on the implementation (ACI on-site GRF training course is available to support Airports)	CAA, Airports, ANSP, Aircraft operators	01/08/2021		
GRF 14	Perform tests/trials prior to the effective implementation	All	01/10/2021		
GRF 15	Applicability date for the new methodology for assessing and reporting runway surface conditions	All	04/11/2021		

Notes: ICAO Runway Safety Go-Team Assistance Missions may be arranged to support States and Airports. ACI APEX Safety Reviews are also available to support Airports.

Remarks: [1] To be tailored and detailed by States; [2] Target dates are indicative only; [3] For input by States

References

Publications / Websites

- Annexes 3, 6, 8, 14, & 15 – applicability date 4 Nov 2021
- PANS Aerodromes (Doc 9981), Aeronautical Information Management (Doc 10066), & Air Traffic Management (Doc 4444)
- Assessment, Measurement and Reporting of Runway Surface Conditions (Cir 355)
- Aeroplane Performance Manual (Doc 10064)
- ICAO GRF website https://www.icao.int/safety/Pages/GRF.aspx
- ICAO EUR/NAT Guidance on the Issuance of SNOWTAM https://www.icao.int/EURNAT/EUR%20and%20NAT%20Documents/EUR%20Documents/EUR%20Documents/SNOWTAM%20Guidance.pdf

Training / Events

- ICAO/ACI Online Course for Airport Operators https://www.olc.aero/product/icao-global-reporting-format/
- ICAO/IATA Online Course for Aircraft Operators & Flight Crew https://www.iata.org/en/training/courses/grf-runway-surface/talp38/en/
- *Future* ICAO-IATA-CANSO Online Course for ANSPs, ATS & AIS staff
- ICAO APAC Regional GRF Seminar https://www.icao.int/APAC/Meetings/Pages/2019-AOP-SG3-GRF-Seminar.aspx
- ICAO Global GRF Symposium https://www.icao.int/Meetings/grf2019/Pages/default.aspx

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.2: ATM

ATM/SG/8 Outcomes (WP10)

3.2.1 The Eighth Meeting of the Air Traffic Management Sub-Group (ATM/SG/8) of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) had been held by Video Teleconference (VTC, 23 – 27 November 2020) from the Regional Office, Bangkok, Thailand.

3.2.2 The meeting had been attended by 220 registered participants from 27 States, two Special Administrative Regions of China and five International and ATM-related organizations, including Afghanistan, Australia, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Hong Kong China, Macao China, Fiji, France (French Polynesia), India, Indonesia, Japan, Lao People's Democratic Republic (PDR), Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea (ROK), Singapore, Sri Lanka, Thailand, United States of America (USA), Viet Nam, CANSO, IATA, IFALPA, IFATCA, and ICAO.

3.2.3 A total of 32 Working Papers (WPs), 17 Information Papers (IPs), one flimsy and eight presentations were considered by the meeting.

3.2.4 The full ATM/SG/8 Report is available on the ICAO APAC Regional Office website at: https://www.icao.int/APAC/Meetings/2020%20ATMSG8/Final%20Report.pdf.

FIT-Asia and RASMAG Outcomes

3.2.5 ICAO had provided a summary of the outcomes from the Tenth Meeting of the FANS Interoperability Team-Asia (FIT-Asia/10, VTC, 03 – 06 August 2020) and the Twenty-Fifth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/25, VTC, 27 – 30 October 2020).

Call sign confusion

3.2.6 With regard to the Category D (*Air Traffic Control – Air Traffic Control (ATC) system loop error*) events, Japan had provided more detailed analysis to the meeting after ICAO asked whether English Language Proficiency (ELP) might be an issue. While acknowledging the potential role of ELP, Japan had noted that a number of these incidents were due to similar call signs. In response to a query from ICAO, IATA had clarified that its similar call sign initiative successfully implemented in the MID Region had not been able to progress in the APAC Region. One of the reasons for this had been the reluctance of aerodrome operators to implement change until an automated tool was available to accommodate alphanumeric call signs. Noting the grave safety risks from such occurrences, RASMAG/25 had agreed to *Draft Conclusion RASMAG/25-3: Alphanumeric Call Sign Initiative*, which was endorsed by the AOP/SG/4 and the ATM/SG/8.

AKARA – FUKUE Corridor

3.2.7 Referring to RASMAG reports that detailed concerns with the AKARA – FUKUE Corridor and potential safety reporting issues, China had stated that safety reporting was not an issue as 'Just Culture' had been implemented in China, meaning that there was no punishment for reporting of safety incidents. China recalled that the AKARA-FUKUE Corridor had been established in 1983, and had maintained a high level safety record, so it was not a new airspace structure. They also stated that there were different views with regard to the Corridor's compliance with Annex 11. China suggested that the relevant issues were not suitable for discussion at APAC meetings before the Technical Working Group (TWG) determined a formal solution, as many participants did not know about the background and detailed information.

3.2.8 In response, ICAO had noted that RASMAG/25 had identified that China's Category E (*Coordination errors in the ATC-to-ATC transfer or control responsibility as a result of human factors issues*) reporting had been well below what could be expected for an environment with only partial AIDC implementation [in 2018 and 2019]. ICAO also noted that with increased scrutiny from multiple States concerned, there had been a major increase in safety reports near position SADLI, at the interface between Chinese and Japanese service within the AKARA – FUKUE Corridor.

Seamless ANS Plan and Monitoring Update

3.2.9 The meeting had noted that the Asia/Pacific Region's primary means of planning to support the ICAO Doc 9750 *Global Air Navigation Plan* (GANP) was the *Asia/Pacific Seamless ANS Plan*, which required the involvement and active participation of States and all stakeholders.

3.2.10 As 2019 had been a review year for the *Asia/Pacific Seamless ATM Plan*, the meeting noted that it had been renamed as the *Asia/Pacific Seamless ANS Plan*, and now included a need to develop a National Air National Plan (NANP). A template for the development of a NANP is at https://www.icao.int/APAC/Documents/edocs/National%20Air%20Navigation%20Template%20V6.0.docx.

3.2.11 The ten priorities had been updated by APANPIRG/30 to 16 priorities. However, the Seamless reporting portal had not been able to be updated thus far to match the 6th Edition of GANP and Version 3.0 of the *Asia/Pacific Seamless ANS Plan*, meaning that data was now unfortunately out-of-date. At the meeting States with ICAO Council Members were requested to advocate for an updated portal to be provided as soon as possible, in accordance with *APANPIRG Conclusion 30-6*. In response to an enquiry from Hong Kong China, ICAO clarified that States/Administrations should withhold updates until the new Seamless Reporting Portal was ready.

ANS USOAP Update

3.2.12 ICAO had provided information on the Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA). The paper discussed the Protocol Questions (PQs) used to assess a State's safety oversight system, and an annual update of ANS USOAP status.

3.2.13 The average ANS Effective Implementation (EI) of the Asia and Pacific (APAC) region at February 2020 was 68.52%. **Figure 3.2-1** illustrates the ANS-related PQs EI ratings of APAC States:

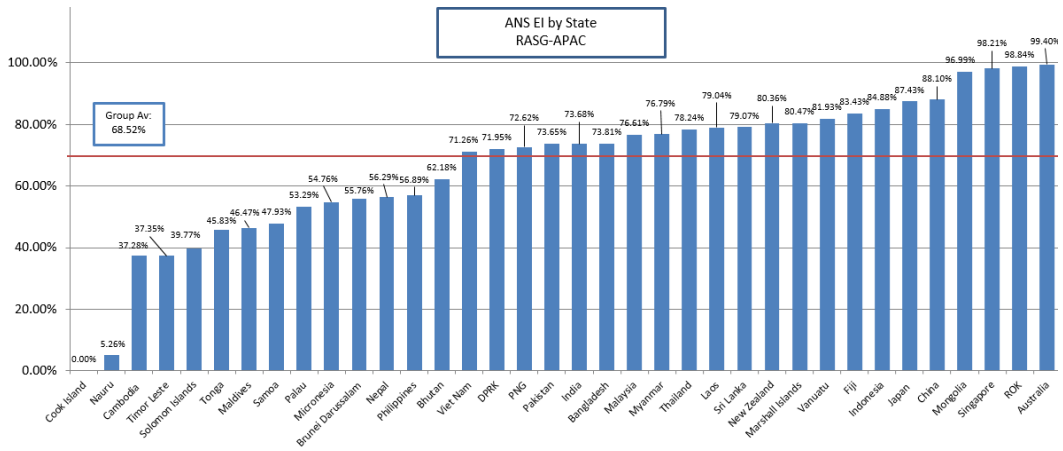


Figure 3.2-1: USOAP ANS EI Comparisons by State (July 2020)

Application of ATC Separation Standards

3.2.14 ICAO had presented data on ATC separation standards being applied within the APAC Region, compared to the *Asia/Pacific Seamless ANS Plan*'s provisions.

3.2.15 When improvements to Air Traffic Services (ATS) surveillance and communications are planned, a core principle of the *Plan* is to provide operational benefits to airspace users for the cost of these improvements. However, in many cases, no benefit had been provided, other than safety monitoring of procedural separations.

3.2.16 Except for China, according to survey data, no State in Asia had been applying ATC separation standards or Transfer of Control (TOC) spacing based on the provisions of the *Asia/Pacific Seamless ANS Plan* and ICAO Document 4444 – *PANS ATM*. Therefore, the Asian Region as a whole had failed to deliver the service levels new CNS systems were capable of.

3.2.17 In particular, ICAO had noted that there were significant weaknesses in many Asian State's application of terminal separations. This inefficiency, and the failure to implement proper Air Traffic Flow Management (ATFM), sequencing mechanisms such as Arrival Manager (AMAN) and efficient Standard Terminal Arrival Routes (STARs) and use of runways for departures between arrivals, meant that many terminal airspace operations were operating well below potential capability.

3.2.18 The ATM/SG/8 had an extensive discussion on the most appropriate ATC separations and TOC spacing, against the background of the need for greater efficiency to respond to COVID-19. Discussion included the background, barriers and the need for efficiency improvements that:

- utilised 5NM enroute and 3NM in terminal airspace, if ATS surveillance is in place and controllers are trained (given that PANS ATM separations included a buffer);
- declared the minimum separation standard for use within an FIR as being based on the State's capability, not that of neighbouring FIRs;
- recognised that the minimum separation standard was expected to be used only as appropriate, as required by controllers on an individual conflict pair basis;
- noted that the assessment of Flight Level Allocation Scheme (FLAS) did not include airspace within 50NM of an FIR boundary;
- recognised that Performance-based Communications and Surveillance (PBCS) is not a factor in the application of ATS surveillance-based separations within VHF coverage; and
- recognised that possible degradation of normal performance should not be used to set the default separation standard, as this is a contingency situation.

Air Navigation Service Deficiencies List

3.2.19 The current List of APANPIRG Air Navigation Deficiencies in the ATM, Aeronautical Information Service (AIS) and Search and Rescue (SAR) fields was reviewed by the meeting. The ATM/SG/8 agreed to the following change proposals for APANPIRG/31's consideration under Agenda Item 4:

- AIS (WGS84) – Thailand deletion;
- AIS (Quality Assurance) – Indonesia and Thailand deletion; and
- SAR capability – India and Indonesia deletion;

Air Traffic Flow Management Steering Group Outcomes (WP11)

3.2.20 The meeting was informed of the outcomes of the 10th Meeting of the Air Traffic Flow Management Steering Group (ATFM/SG/10), held by Video Teleconference from 04 to 08 May 2020.

Regional ATFM Systems

3.2.21 The ATFM/SG/10 meeting had been informed of Bay of Bengal Cooperative ATFM (BOBCAT) traffic demand for the period from January 2018 – March 2020.

3.2.22 Overall, the percentage of flights achieving BOBCAT slot-allocated (or better) flight levels had been in the range 73 – 94%. Major causes of failure to enter the Kabul FIR at the BOBCAT slot-allocated level were non-compliance with Calculated Time Over (CTO, 46%), or Calculated Take Off Time (CTOT, 29%).

3.2.23 The Asia/Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC, formerly the Distributed Multi-Nodal ATFM Network and composed of Cambodia, China, Hong Kong China, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam) had informed the ATFM/SG/10 of overall compliance with ATFM measures of 73% (Level 3 nodes) and 70% (Level 2). The AMNAC Common Operating Procedure was updated to resolve CTOT revision in cases where the revised CTOT was issued with insufficient time for stakeholders to react.

3.2.24 The Northeast Asia Regional ATFM Harmonization Group (NARAHG – China, Japan and Republic of Korea) had, as the first steps towards interoperability, exchanged ATFM Daily Plans (ADPs). Exchange of CTOT with Hong Kong, China had been agreed by Japan and was being planned by the ROK. This was expected to help develop harmonization between AMNAC and NARAHG. China advised that, following a system upgrade, Shanghai ATFMU would share ADPs with AMNAC ATFMUs. There was no current plan for all China FIRs to share ADPs.

3.2.25 The ATFM Information Requirements Small Working Group (ATFM/IR/SWG) had developed an ADP exchange procedure. ATFM/SG/10 had agreed to *Conclusion ATFM/SG/10-2: ADP Exchange Procedure Working Draft*, making the procedure available for use by Administrations pending its inclusion in the future amendment of the *Regional Framework for Collaborative ATFM*.

3.2.26 India had informed ATFM/SG/10 of the status of ATFM implementation and the integration of ATFM and Airport Collaborative Decision-Making (A-CDM) at major airports in India. A Beta version of India's ATFM portal had been developed (www.atfmaai.aero/portal). Cross-border ATFM was planned for inclusion in Phase III of the ATFM project, for implementation in 2021 or later. An agreement for ATFM assistance to Nepal was being considered by the Ministry of Civil Aviation.

Regional ATFM Implementation Status

3.2.27 APAC ATFM implementation status was reported to the ATM/SG/8 against the performance expectations of the *Regional Framework for Collaborative ATFM*. States were assessed as having *Robust* (90-100%), *Marginal* (70-89%) or *Incomplete* (0-69%) implementation as follows:

- India, Singapore and USA were assessed as having *Robust* implementation;
- *Marginal* implementation was recorded for Australia, Cambodia, China, Japan, Republic of Korea, and Thailand; and
- Bangladesh, Hong Kong China, Macao China, Indonesia, Maldives, Myanmar, Nepal, New Caledonia, New Zealand, Pakistan, Papua New Guinea, Philippines and Viet Nam were assessed as *Incomplete*.

Missing Departure (DEP) Messages

3.2.28 The meeting was provided with an update on the issue of missing Departure (DEP) messages. ANS Deficiencies had been agreed by APANPIRG/30, where the most recent regional analysis indicated 5% or more of the required DEP messages were not being received by en-route and/or destination ATS units for: Bangladesh, India, Malaysia, Maldives, Nepal and the USA.

3.2.29 Due to the impact of the COVID-19 pandemic on traffic volumes, the DEP message data gathering and analysis activity planned for March-April 2020 would render any such analysis unrepresentative. The activity was deferred until such time as international traffic reached more normalized levels.

3.2.30 In response to a request from ICAO, Thailand had provided a detailed analysis of the monthly non-receipt of DEP messages for the period January 2018 to March 2020, for the Bangkok FIR. While the non-receipt of DEP messages from all originators had reduced from 17% to 10%, the overall performance of APAC Administrations had improved from 12% to 3%.

ATFM Post-Operations Analysis Recommended Framework

3.2.31 The ATFM/SG/8 meeting agreed to the following Conclusion, adopting the final version of the ATFM Post-Operations Analysis Recommended Framework, initially developed for ATFM/SG by the core team of AMNAC and further improved by input from Australia, India and Japan:

Conclusion ATFM/SG/8-1: ATFM Post-Operations Analysis Recommended Framework Version 1.0

That:

*1. The ATFM Post-Operations Analysis Recommended Framework Version 1.0 at **ATM/SG/8 WP11 Attachment 2** be uploaded to the ICAO Asia/Pacific Regional Office eDocuments web-page, to replace the existing working draft version; and*

2. States are urged to utilize the guidance provided in the document when implementing ATFM post-operations analysis in accordance with the performance expectations of the Regional Framework for Collaborative ATFM

Asia/Pacific Unmanned Aircraft Systems Update

3.2.32 ICAO had provided information on developments in the field of Unmanned Aircraft Systems (UAS), recalling that ATM/SG/7 had adopted the *Asia/Pacific Regional Guidance for the Regulation and Safe Operation of UAS within National Airspace* (*Conclusion ATM/SG/7-9*).

3.2.33 The UAS Advisory Group (UAS-AG) of the Remotely-Piloted Aircraft Systems (RPAS) Panel had developed the ICAO UAS Toolkit, which was a repository of information on the management of UAS that fell outside the scope of Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) developed for RPAS operations. The toolkit was available at https://www.icao.int/safety/UA/UASToolkit/Pages/default.aspx.

3.2.34 The ICAO DRONE ENABLE 2021 Symposium would be held by VTC from 13 – 15 and 20 – 21 April 2021. More information was available at www.icao.int/meetings/droneenable4.

Establishment of ADS-B Out Exclusive Airspace

3.2.35 Singapore had presented its plan to establish Automatic Dependent Surveillance-Broadcast (ADS-B) out exclusive airspace within the Singapore FIR in phases, to fulfil the objectives of the *Asia/Pacific Seamless ANS Plan* to enhance safety and optimise airspace.

3.2.36 The implementation Plan expected to mandate ADS-B out exclusive airspace requiring aircraft operating at and above FL290 within the north-eastern portion of the Singapore FIR to be ADS-B equipped from January 2022. An extension of the mandate to the whole Singapore FIR was planned from January 2023.

3.2.37 ICAO had recalled the need for a Doc. 7030 amendment to contain a regional air navigation agreement for a mandate within that portion of international airspace over the 'high seas'. The meeting also noted that there were a number of other States contemplating the use of ADS-B within international airspace, including Space-based (SB) ADS-B, so it would be better to have several States jointly submit a Proposal for Amendment (PfA). The Chair had encouraged a Small Working Group of interested States to work on the PfA.

Regional Air Navigation Plan Update

3.2.38 ICAO presented an update on the progress of the electronic Air Navigation Plan (eANP) development for the Asia/Pacific, which was intended to replace ICAO Doc. 9673. Meeting participants were invited to review the FIR and Search and Rescue Region (SRR) data affecting their administration, and provide feedback to ICAO on the data's accuracy.

3.2.39 By 01 April 2021, the FIR data review from States was expected to be completed, and the data that had been verified for the eANP FIR Table after approval by the President of the Council on behalf of the ICAO Council. The SRR review was expected to be conducted in 2021.

3.2.40 The ANP was currently in the form of pdfs on the APAC website. The electronic ANP (eANP) with full hyperlink and html functionality was expected to be available at the end of 2021.

3.2.41 As at November 2020, thirty-one FIRs were either in the process of completing their verification by PfA to the ANP, or had been verified already (**Figure 3.2-2**).

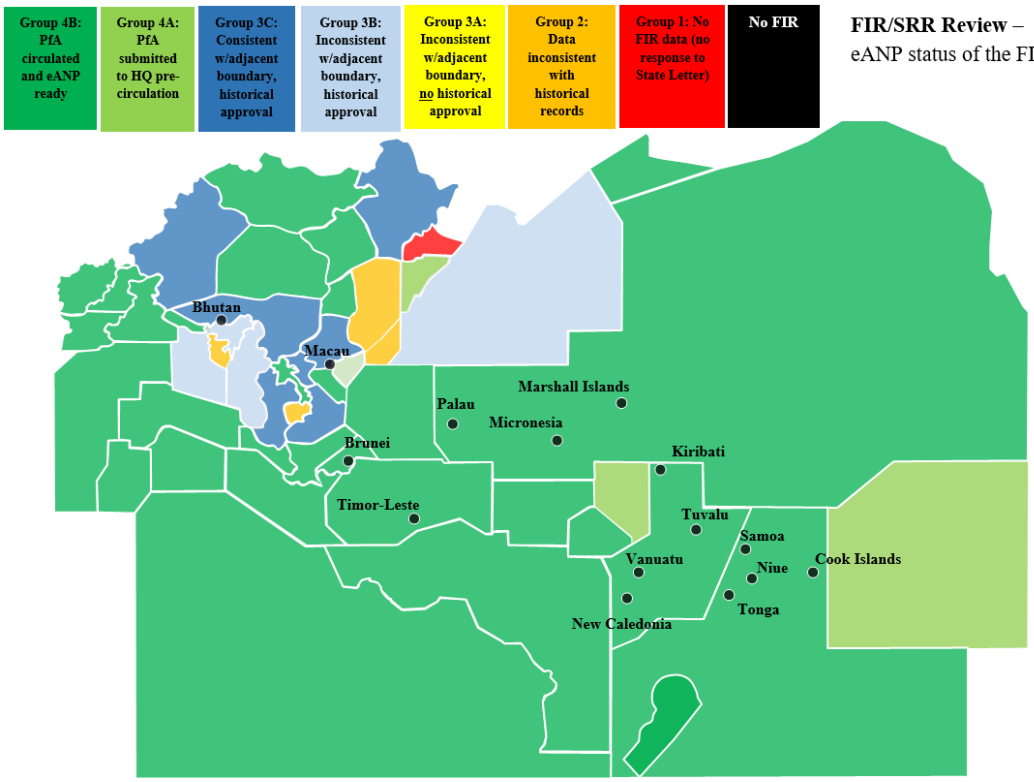


Figure 3.2-2: FIR Review Status

3.2.42 China had stated the Shanghai and Taibei FIR PfAs had been based on historical documents, so were not new proposals. Since 1983 a note had been published in its State Aeronautical Information Publication (AIP): *The present delineation of the boundaries of Shanghai and Taibei FIRs over the sea area is unreasonable and unfavourable to safety, regularity and cost-effectiveness of flight operations and is therefore unacceptable to China....*'. ICAO had responded by advising that State AIPs were not a legal source of FIR information, unless supported by an approved PfA.

3.2.43 India had asked about the status of the Kolkata FIR's verification, stating that the PfA had been submitted after validating the data published in the AIP of all adjacent FIRs, and as such there was no difference at the date of submission. ICAO advised that significant work needed to be conducted before PfA circulation, to ensure that the possibility of an objection was minimised.

3.2.44 APANPIRG/31 noted that there were issues in four areas affecting the resolution of 11 FIRs affecting progress, each with a political dimension. Thus, APANPIRG/31 endorsed the process proposed by ICAO to be used to resolve the issues as follows:

a) one coordinate between the Lahore/Karachi FIRs and the Delhi FIR (ICAO proposes to resolve this by bilateral negotiation between India and Pakistan as the national border is between the two coordinates each nation proposes (**APANPIRG 31 AI 3.2 WP10 Attachment A**);

b) two coordinates, one coordinate between the Dhaka and Kolkata FIRs and one between the Dhaka and Yangon FIRs, at the point where the common national boundaries meet the shoreline (ICAO proposes to resolve this by bilateral negotiation between India and Bangladesh, and between Bangladesh and Myanmar, noting that discussion through 'diplomatic' channels may hinder progress due to the possible time taken when this was not a matter of sovereign airspace but service delivery, thus the bilateral discussion should be conducted at an operational/technical level (**APANPIRG 31 AI 3.2 WP10 Attachment B**);

c) one single coordinate between the Russian Federation's Khabarovsk FIR and the Fukuoka FIR (ICAO proposes to discuss this with the EUR/NAT Office as suggested by ICAO HQ in order to conduct bilateral discussion between the Russian Federation and Japan, with the two ROs supporting as required (**APANPIRG 31 AI 3.2 WP10 Attachment C**); and

d) a narrow sliver of airspace claimed by Cambodia in the Gulf of Thailand based on three coordinates, affecting the Bangkok, Phnom Penh and Ho Chi Minh FIRs (ICAO proposes to conduct this with a trilateral discussion between the States concerned, noting that this is international airspace and the two options presented by ICAO in (**APANPIRG 31 AI 3.2 WP10 Attachment D**).

Space-Based ADS-B Coverage Over Indian FIRs

3.2.45 India had provided the meeting with news of SB ADS-B surveillance over the entire Indian oceanic airspace, commencing 01 January 2021, describing its many benefits, including traffic awareness and monitoring during Phase I. During Phase II, more efficient separation minima would be introduced to enhance airspace capacity, maintaining the same or improved level of safety.

Trans-Regional ATS Coordination

3.2.46 ICAO had presented information on trans-regional ATS coordination, focusing on Asia/Pacific Region's (APAC's) interfaces with the ICAO African (AFI), Middle East (MID) and European Regions (EUR). No specific ATM-related trans-regional meeting had taken place in 2020.

ATS Route Catalogue

3.2.47 The meeting had reviewed the *Asia/Pacific Region ATS Route Catalogue*. The update had been prepared by the ICAO APAC Regional Sub-Office (RSO) after correspondence with all concerned States/Administration and IATA, requesting status updates on relevant route proposals. Feedback had been incorporated into the draft *Catalogue*, which was reviewed and agreed by the meeting as Version 20, to be uploaded to the APAC website.

3.2.48 IATA had requested States to urgently conduct a detailed review of routes in their area of responsibility for possible implementation, given the changed COVID 19 pandemic environment and expected 'new normal' for aviation operations. IATA advocated that flexibility and efficiency were key areas to support a recovery for aviation, noting that 'we should be aiming to come out of this crisis stronger and more efficient than we went into it'.

Civil/Military Cooperation Update

3.2.49 ICAO had highlighted Asia/Pacific's civil-military cooperation issues and initiatives, which were critical for safety and efficient procedures relevant to COVID-19 recovery to support airlines. The meeting recalled that civil-military cooperation remained one of the highest priority items in the Asia/Pacific Region, as evidenced by the eleven Seamless ATM elements on this subject.

3.2.50 Unlike past years, during 2020 the ICAO Regional Office had not received reports of significant disruptions or rocket debris from launches originating from China's Jiuquan and Taiyuan sites landing near populated areas in other States. However, the meeting reviewed details of ballistic launch and re-entry activities emanating from Hainan Island that had been notified by China affecting Viet Nam's international and national (territorial) airspace during July and September 2020. The meeting noted that it appeared that these notifications and the process of expected consultation did not comply with regional policy set out by APANPIRG and the *Asia/Pacific Seamless ATM Plan*. ICAO HQ was involved in discussing this matter with China.

3.2.51 Viet Nam had expressed its thanks to ICAO for highlighting the significant concerns related to ballistic launch and space re-entry from Hainan Island. According to Viet Nam, the space flight activities from China potentially created significant hazards to the safety of flight operations within its FIRs (especially those operations on high density ATS routes). Moreover, 'restricted areas' were established by China outside its sovereign airspace, and civil flight activity was 'forbidden' over the high seas, which was inconsistent with the Chicago Convention and the UN Convention on the Law of the Sea (UNCLOS), to which China is a Party. Viet Nam requested China to strictly comply with international law, ICAO SARPS and regional policy set out by APANPIRG and the *Asia/Pacific Seamless ATM Plan*, to ensure the safety of flight operations. Viet Nam stated that it supported ICAO having a leading role in resolving this matter.

3.2.52 In response, China stated that it had strictly followed the regional policy, and that issues relating to civil-military operations were too sensitive and political to be discussed at the ATM/SG. China proposed to have a bilateral meeting between China and Viet Nam to resolve this issue.

3.2.53 ICAO extended its appreciation to the Air Traffic Management Bureau (ATMB) of the China Civil Aviation Administration (CAAC) for the effort undertaken to reduce ATM delays, with fewer reports of this nature reported in 2020.

3.2.54 The meeting noted that there had been no change to the Air Defence Identification Zone (ADIZ) ad hoc conditions that had been imposed by Bangladesh within international airspace in 2018.

3.2.55 With respect to Special Use Airspace (SUA), there had been a number of restricted areas designated within international airspace, which was not permissible. The meeting noted that SUA in Chinese, Japanese, Korean and Malaysian airspace could be subject of a Deficiency, unless the airspace was re-designated as a danger area or disestablished before APANPIRG/32.

Regional ATM Contingency Planning and Status Reporting

3.2.56 ICAO had provided information on ATM contingency planning. The meeting was reminded that Annex 11 Section 2.32 *Contingency Arrangements* required that ATS authorities must develop and promulgate contingency plans.

3.2.57 The *Asia/Pacific Regional ATM Contingency Plan* also included relevant performance expectations that were expected to be implemented by 10 November 2016, reflecting the Annex 11 requirement which had been applicable since November 2003.

3.2.58 Based on annual status reports, the implementation of ATM contingency planning by APAC Administrations were assessed as *robust* (90 – 100% implementation), *marginal* (70 – 89%) or *incomplete* (0 – 69%).

3.2.59 Australia, Indonesia and Singapore were assessed as having *robust* contingency plans implemented. Marginal implementation was recorded for Malaysia, Pakistan, Republic of Korea and Viet Nam. The contingency planning of Bangladesh, Cambodia, Hong Kong China, Macao China, Japan, Maldives, Mongolia, Myanmar, Nepal, New Caledonia, Papua New Guinea, Philippines, Sri Lanka and Thailand was assessed as *incomplete.*

3.2.60 The following States had not reported their contingency planning status:

Afghanistan, Bhutan, Brunei Darussalam, China, Cook Islands, Fiji, France (French Polynesia), DPR Korea, India, Kiribati, Lao PDR, Marshall Islands, Micronesia, Nauru, New Zealand, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, United States and Vanuatu.

3.2.61 The meeting was informed of APAC activities relating to ATM contingency planning in response to the COVID-19 pandemic. Activities included ATM-specific seminars held by VTC, and presentations and proposed recommendations to the Asia/Pacific COVID-19 Contingency Recovery and Planning Group (ACCRPG). Outcomes of these activities included the development of the APAC Regional Strategy for COVID-19-related ATM Contingency Recovery (**ATM/SG/8 WP/24 Attachment B**). The meeting was particularly urged to consider the impact of re-opening of traffic to service travel bubbles or city pairs, and the need to ensure that the ATM capacity of all affected FIRs was taken into account, as described in the list of Air Navigation Service Provider (ANSP) and ICAO actions in the strategy document.

3.2.62 ICAO stressed that ANSPs needed to be aware of the imminent increase of freight flights delivering vaccines worldwide, so they should consider the capacity and contingency ramifications of this as part of their planning in the next few weeks. IATA expressed its thanks to the ICAO Regional Office for its efforts to strengthen contingency planning.

3.2.63 IATA estimated that about 8,000 extra flights would be undertaken over a period of some months for vaccine distribution, depending on the production of vaccines. IATA informed the meeting that vaccine guidance material was available at:

- https://www.iata.org/en/programs/covid-19-resources-guidelines/; and
- https://www.iata.org/en/programs/cargo/

AIS – AIM Implementation Task Force Outcomes

3.2.64 The outcomes of the Fifteenth Meeting of the Aeronautical Information Services (AIS) – Aeronautical Information Management (AIM) Implementation Task Force (AAITF/15, VTC, 01 – 05 June 2020) were reported to the ATM/SG/8 meeting.

AIS-Related Air Navigation Service Deficiencies

3.2.65 The AAITF/15 meeting agreed that deficiencies be deleted as proposed by Indonesia and Thailand, subject to further offline coordination of documented evidence of implementation, and subsequent sampling of aeronautical information products by the ICAO Regional Office. The criteria used by the ICAO Regional Office were provided at **ATM/SG/8 WP26 Attachment A**.

3.2.66 The following deficiencies were proposed for deletion by the ATM/SG/8:

- Quality Management System not implemented – Indonesia and Thailand; and
- WGS-84 not implemented – Thailand.

3.2.67 The meeting had been invited to once again note the ongoing, high level of concern about poor quality management of aeronautical information in the APAC Region, and the apparent lack of organizational priority for this safety-critical requirement.

NOTAMS

3.2.68 Information was provided on NOTAM proliferation, and on the Regional Office process for recording Air Navigation Deficiencies for non-compliance with the relevant provisions of Annex 15 and PANS-AIM relating to NOTAM management. In this regard, the meeting was reminded of *Conclusion ATM/SG/6-14: Management of NOTAMs*, which had urged States to take immediate action to reduce the large numbers of permanent or long duration NOTAMs (more than 90 days' validity). A detailed analysis was provided in **ATM/SG/8 WP/26 Attachment B**.

3.2.69 As at 01 September 2020 a total of 6,844 NOTAMs were valid in the APAC Region, and 1,469 of these had been published before 01 June 2020. In comparison with the data reported in 2019, by September 2020 the total number of valid NOTAMs in the APAC Region had increased by 17%, while the number of long term NOTAMs had decreased by 14.8%. The percentage of valid NOTAMs that were old-aged had decreased by 8%, remaining unacceptably high. **Figure 3.2-3** illustrated the APAC Administrations having more than 10 long term NOTAMs, as at April and September 2020.

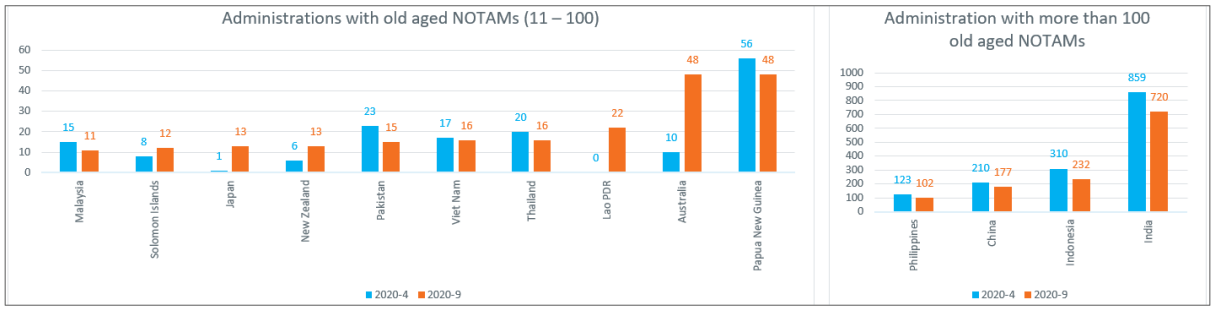


Figure 3.2-3: Administrations with more than 10 long term NOTAMs – 2020

3.2.70 In addition to globally coordinated ICAO efforts to reduce NOTAM proliferation, local action within the APAC Region would include direct action to encourage compliance with the provisions of Annex 15 and PANS-AIM, in addition to consideration of APANPIRG ANS Deficiencies where appropriate. The meeting was also informed of the NOTAMETER application at: https://www.icao.int/safety/iStars/Pages/Notameter.aspx.

3.2.71 The meeting had also been informed of ICAO State Letter AP086/20 (ATM), dated 26 March 2020, responding to global concerns about the quality of NOTAMS promulgating information on COVID-19-related aerodrome and/or ATS contingency operations. The State Letter included template NOTAMs for guidance.

Regional Implementation Status of AIM Performance Expectations

3.2.72 A summary of the implementation progress of the AIM performance expectations in the *APAC Regional Plan for Collaborative AIM* was provided. The total number of Administrations providing reports in 2020 (13) compared poorly with the 26 Administrations that had reported in time for AAITF/14 in 2019. Administrations that had reported their AIM implementation status were:

Australia, Bangladesh, Cambodia, China, Hong Kong China, Indonesia, Japan, Mongolia, Pakistan, Singapore, Sri Lanka, Thailand and Viet Nam.

3.2.73 **Figures 3.2-4 and 3.2-5** illustrated overall regional implementation of Phase I (immediate implementation expected) and Phase II (implementation expected by November 2019) elements of the *Regional Plan for Collaborative AIM*; approximately 51% percent for Phase I, and 38% for Phase II.

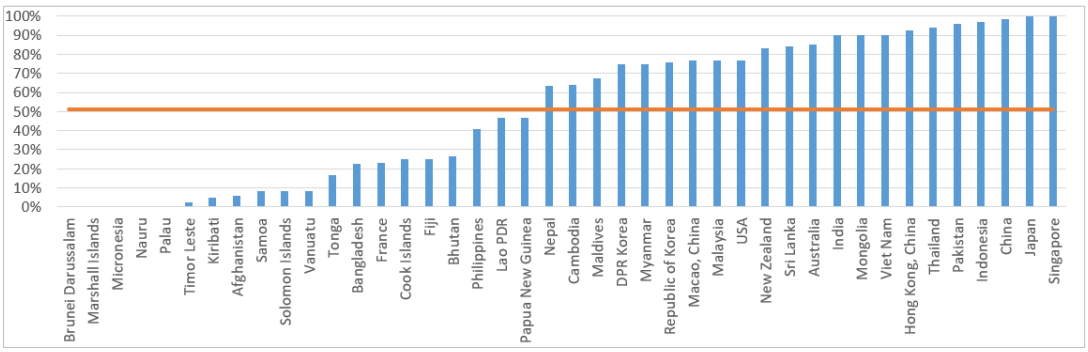


Figure 3.2-4: Regional Phase I Implementation Progress (updated 17 November, 2020)

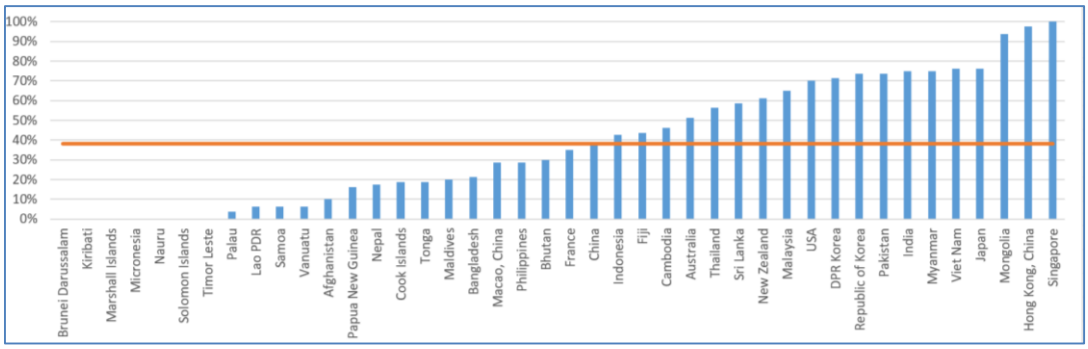


Figure 3.2-5: Regional Phase II Implementation Progress (updated 11 November, 2020)

3.2.74 Japan and Singapore had reported implementation of all Phase I elements. Only Singapore had reported implementation of all Phase II elements. No Administration had reported implementation of all Phase III elements. Regional implementation of Phase III elements, expected to be implemented by 2025, was approximately 10%.

APAC ICARD Status and 5LNC Duplicate Resolution

3.2.75 The AAITF/15 had been informed of the status of the ICAO International Codes and Route Designators (ICARD) application and the resolution of APAC 5-letter name code (5LNC) duplicates.

3.2.76 ICAO Headquarters had compiled a full global list of duplicated 5LNC in 2018. At that time there were 3,905 duplicated 5LNCs worldwide, of which 2,733 had been within the APAC Region. **Figure 3.2-6** illustrated the number of 5LNCs registered globally, and in the APAC Region.

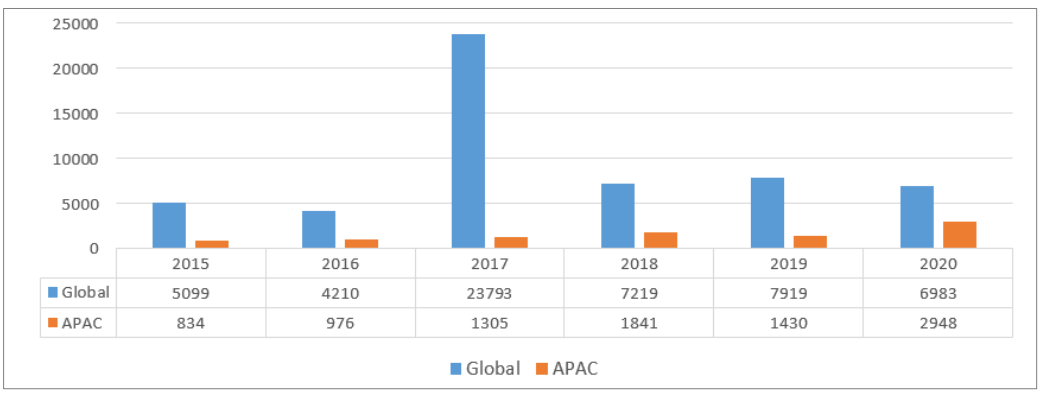


Figure 3.2-6: ICARD Usage, 2015 – 2020

SNOWTAM

3.2.77 The AAITF/15 had agreed to *Conclusion AAITF/15-1: Guidance on the Issuance of SNOWTAM*, supporting the APAC use of the *European and North Atlantic Region Guidance on the Issuance of SNOWTAM*, pending a future update of the APAC Operating Procedures for Aeronautical Dynamic Data (OPADD). Subsequent to AAITF/15, ICAO had issued State Letter 2020/73, dated 30/07/2020, notifying the postponement of the applicability of SARPS and PANS until 04 November 2021. The guidance document on the APAC Regional Office eDocuments web-page had been updated to reflect the changed applicability date.

PBN Approach Chart Identification Transition

3.2.78 The AAITF/15 meeting was informed of ICAO Electronic Bulletin (EB) 2020/21. The EB advised States to limit as far as possible new or amended information provided under the Aeronautical Information Regulation and Control (AIRAC) system, due to the COVID-19 pandemic and consequent contingency operations of aeronautical data houses. However, noting the significant number of charts that some APAC Administrations would have to transition and *Conclusion APANPIRG/30/14*, the AAITF/15 stressed that APAC Administrations should continue to process chart changes in accordance with the *APAC Regional Transition Plan for RNP APCH Chart Identification* plan, as part of a globally coordinated and agreed plan to ensure implementation by the November 2022 applicability date.

AIS Points of Contact

3.2.79 AIS Points of Contact (POC) were included in the consolidated APAC ATM Contact List. The following APAC Administrations had not yet nominated any AIS POC:

Brunei Darussalam, France (French Polynesia and New Caledonia), Kiribati, Marshall Islands, Micronesia, Nauru, Palau, Samoa, Solomon Islands and Tonga.

AAITF Terms of Reference

3.2.80 The meeting agreed to minor changes to the AAITF TOR to incorporate reference to PANS-AIM, and to reflect the renaming of the *Asia/Pacific Seamless ANS Plan*:

<table>
<tr><td colspan="3">Decision APANPIRG/31/9: Amend AAITF Terms of Reference</td></tr>
<tr><td colspan="2">What: That, the amended Terms of Reference for AAITF at Appendix A to the Report on Agenda Item 3.2 be adopted.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To incorporate reference to ICAO Doc 10066 Procedures for Air Navigation Services – Aeronautical Information Management (PANS-AIM), and to reflect the renaming of the Asia/Pacific Seamless ANS Plan (formerly the Seamless ATM Plan)</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

Asia/Pacific Search and Rescue Update

3.2.81 The Fifth Meeting of the Asia/Pacific Regional Search and Rescue Work Group (APSAR/WG/5) had been held from 09 to 11 June 2020 by VTC.

3.2.82 ICAO HQ had presented a summary of the activities undertaken by ICAO at the global level to support the implementation of the Global Aeronautical Distress and Safety System (GADSS), including developments relating to the location of an aircraft in distress repository (LADR).

3.2.83 The meeting was informed that the PANS-OPS Volume III GADSS Autonomous Distress Tracking (ADT) and LADR procedures were now envisaged for applicability on 4 November 2021, while the Annex 6 ADT aircraft equipage requirements were delayed from 01 January 2021 until 01 January 2023. Provisions included procedures for aircraft operators to track aircraft, responding to tracking systems in an appropriate manner and forwarding information received from an ADT to the LADR.

3.2.84 States had provided updates to the meeting. The USA had commented on Indonesia's positive progress on their SAR-related APANPIRG Deficiencies. Indonesia had expressed its desire to conclude a SAR Letter of Agreement (LOA) with India, and India also expressed its desire to have a LOA with Indonesia. The APSAR/WG/5 had agreed that India and Indonesia's status reports were sufficient to recommend the deletion of the current SAR-related Deficiency.

3.2.85 The meeting had noted that in 2018, the SAR false alert rate was 96.85%, or about one real alert confirmed in 32 alerts received. The rate of false reports had not changed substantially since 2014. Cospas-Sarsat had reported an increase in the number beacons that report location in an alert message (87.4% in 2018), and the number of 406 MHz beacons worldwide by about 7%.

3.2.86 An analysis of the 26 USOAP SAR-related PQs indicated that the overall SAR EI had risen for the Asia/Pacific Region since 2015 from 50.7% to 60% in May 2020. The APSAR/WG/5 noted that this represented positive progress, although the average achieved fell well short of what would be a satisfactory level to SAR experts.

3.2.87 The SAR Plan-based 41 element assessment provided a metric of *Asia/Pacific SAR Plan* implementation as at November 2020, taking into account updates from Afghanistan, Cook Islands, Fiji, French Polynesia, New Caledonia, Pakistan, Republic of Korea and Viet Nam (**Figure 3.2-7**).

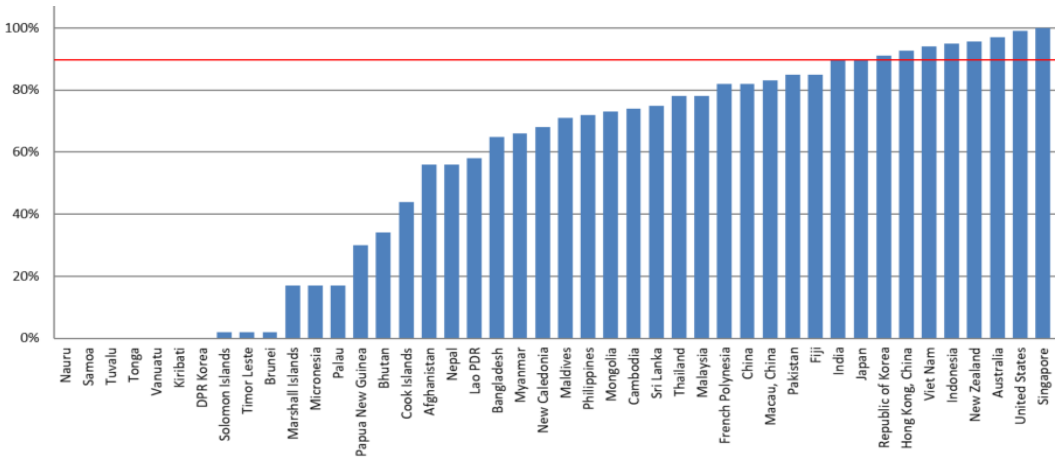


Figure 3.2-7: *Asia/Pacific SAR Plan* Implementation (November 2020, average 55%)

3.2.88 The overall *Asia/Pacific SAR Plan* compliance is illustrated in **Figure 3.2-8**.

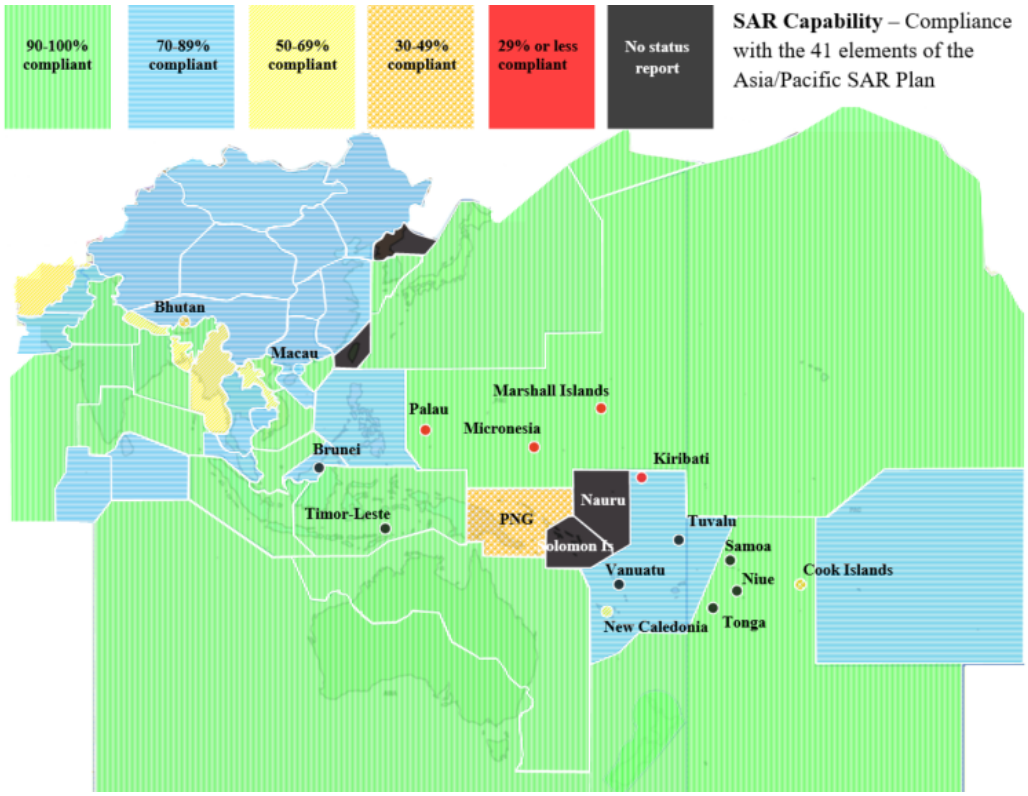


Figure 3.2-8: Asia/Pacific SAR Plan Implementation Status (November 2020)

3.2.89 The USA had congratulated the APAC Region for its continued work to support SAR, which had been recognised at ICAO HQ level.

ATM Security Requirements

3.2.90 ICAO presented information on ANSP/ATM ICAO security requirements, and additional information relating to the establishment and dissemination of the 1st Edition of the *ICAO Cyber Security Action Plan* and ongoing developments in related guidance material and resources.

3.2.91 Noting the output of the ICAO Cyber Security Study Group and the provisions of the *Cybersecurity Action Plan*, *Training Roadmap* and *Trust Framework*, States were urged to disseminate the *Cybersecurity Action Plan* and coordinate its implementation with all relevant national agencies, industry, and stakeholders in accordance with State Letter AS8/1.9.1-20/114 (05 November 2020).

COVID-19 ATM Economics

3.2.92 IATA had stressed that airlines were in an extremely precarious financial position (data: https://www.iata.org/en/iata-repository/publications/economic-reports/airline-industry-economic-performance---november-2020---report/), so costs must deliver a benefit. To ensure the significant benefits offered by air transport continue, they noted that a whole-of-government response is required to recover from COVID-19. This must include government support for key system enablers like ANSPs in order to avoid unsustainable cost increases that airlines would be unable to absorb.

3.2.93 Regarding Capital Expenditure (CAPEX) Projects or Operational Expenditure (OPEX) Initiatives, IATA also stated that a post-COVID-19 review of services required consideration of rationalisation of services or an assessment of graduated services to reflect the reality of the new operating environment. Most importantly, any change must ensure a tangible benefit to airspace users with safety improvements, and efficiency or fuel savings.

3.2.94 IATA stated that to help drive growth, ANSPs should reduce current charges in order to stimulate flights, which drives revenue. In analysing the elasticity of demand, analysis had shown that a combination of lower rates driving more rapid growth in flight numbers can increase ANSP revenue more rapidly. However, maintaining or increasing charges is likely to stymie any recovery, as most airlines will be unable to operate. The meeting agreed to the following Conclusion:

<table>
<tr><td colspan="3">Conclusion APANPIRG/31/10: Review of National Air Navigation Plans (NANPs)</td></tr>
<tr><td colspan="2">What: That, States should review their NANPs in accordance with a whole-of-government approach and the requirements of the Regional Air Navigation Plan to:
(1) include airspace user consultation to determine post COVID-19 service provision levels and the related investment and expenditure required, including identifying temporary or permanent service provision modification to reduce operational costs; and
(2) seek government support for their Air Navigation Service Providers (ANSPs) during the post-COVID-19 recovery.</td><td>Expected impact:
☒ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Review of service provision can support reductions in ANSP cost-base and therefore a reduction in target revenue required for cost-recovery, which drives ANS charges. Effective market stimulation and recovery can reduce the financial exposure of the government.</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

ATM Economics Seminar Outcomes

3.2.95 The outcomes of the COVID-19-Related ATM Economics Seminar (VTC, 08 October 2020) were presented to the meeting. Nine presentations were made during the Seminar, which are available at: https://www.icao.int/APAC/Meetings/Pages/2020-COVID-19-ATM-Seminar.aspx.

3.2.96 The Seminar had noted that if ANS losses during the pandemic had been high at USD 7.5 billion by October 2020, then this had only been 3.7% of airline losses (APAC the most).

3.2.97 ICAO had noted the positive efforts of some ANSPs to improve efficiencies to support airlines, including India and Indonesia. However, in general, ICAO hadn't noted many ANSPs taking action in accordance with the Council's Aviation Recovery Task Force (CART) Recommendation 10, which requested States to consider appropriate extraordinary emergency measures to support financial viability and to maintain an adequate level of safe, secure and efficient operations.

3.2.98 ICAO had stressed that the pandemic taught that it was necessary to work together across traditional lines for a cohesive national response – bringing together different government agencies, civil and military entities; and understanding the public need, as this is the national interest. The Seminar had noted that the Indian Government had supported airline recovery by establishing a civil/military cooperation Airspace Review Committee for a significant optimisation of airspace.

3.2.99 CANSO had stated that with reduced traffic levels, there were opportunities to review current airspace restrictions and to look for ways to improve service provision to minimise operational delays and inefficient routings. CANSO had noted that ANSPs were likely to be dealing with more modern and better equipped fleets, so this was an opportunity for ANSPs to advance projects such as PBN and ADS-B which typically required relatively lower capital, leading to modernised airspace while potentially reducing ATM costs.

3.2.100 The New Zealand ANSP described actions such as stakeholder engagement, government assistance and capital raising programmes at the high level, while also addressing operational matters such as capital programme delays, operating cost savings and staff rationalization. Airways NZ also offered discounted services or products, reasoning that any cash flow was better than none, and 'as an industry we are all in this together'.

3.2.101 Singapore had described measures to reduce fuel burn such as direct routings. Singapore had also offered significant rebates to airlines on landing charges, airport rentals, parking charges and regulatory fees.

3.2.102 Of the many actions taken to enhance efficiency by India, the most significant were the release of SUA under Flexible Use Airspace (FUA) provisions above FL325 north of latitude 16N, and all airspace south of latitude 16N above FL255, removal of FLAS restrictions over the Indian Ocean, and extensive provision of direct routes.

3.2.103 Some examples of the innovations pursued during the COVID-19 pandemic by Indonesia in order to stimulate traffic growth and enhance operational efficiency had included flexibility of slot management policies, remote ATS services, use of Traffic Information Broadcast by Aircraft (TIBA) procedures, availability of User Preferred Routes (UPR) and online coordination meetings between Indonesian and Australian regulators and ANSPs.

3.2.104 IATA had expressed its appreciation to ICAO for holding the ATM Economics Seminar, and for the participation of States and their presentations. IATA noted that savings facilitated by States had been extremely valuable, for economic and environmental benefits.

FF-ICE and the Future of ATM (WP19)

3.2.105 Singapore presented information on the envisaged benefits and role of Flight and Flow – Information for a Collaborative Environment (FF-ICE) in future ATM, as described in ICAO Doc 9965 – *Manual on Flight and Flow – Information for a Collaborative Environment*. Different roles were proposed that ICAO and States could take to facilitate the transition in order to minimise the potential confusion caused by mixed mode operations, as well as to maximise the benefits brought about by FF-ICE.

3.2.106 The FF-ICE concept, supported by System-Wide Information Management (SWIM) would modernize the flight planning process to enable the realization of the Global Air Traffic Management Operational Concept (GATMOC, ICAO Doc 9854) and form the foundation for Trajectory-Based Operations (TBO). The first release of FF-ICE, focused on planning activities in the pre-departure phase, would include the Planning Service and Trial Service. States were encouraged to conduct benefit analyses, and technical and/or operational trials.

3.2.107 Thailand had informed the meeting that it intended to conduct trials with Singapore, and highlighted that the regional consideration should also be given to CRV and SWIM as they are enablers for not only future operational concepts like FF-ICE and TBO but also the improved efficiency of current ATM operations. Japan offered assistance to support the APAC Region from its experience. India, CANSO and IATA all supported a coordinated regional approach.

Open ATM – A New Approach to Future ATM Systems (WP20)

3.2.108 Singapore had provided information on likely trends in future ATM development that Singapore and industry were working on, to illustrate the benefits of a new approach to ATM operations.

3.2.109 Noting the future ATM operating environment would necessitate adaptations and changes at greater pace, Singapore had been exploring the concept of an Open ATM System using open standards and technologies to split ATM systems into discrete components, each encapsulating individual functions of the ATM system. The concept could be based on industry model of microservices architecture, and could result in the ANSP gaining a system that was easily scalable and deployable, and more flexible, resilient and adaptable.

3.2.110 Hong Kong China, Thailand, Pakistan, the USA, CANSO and IATA all welcomed the initiative supporting open architecture and adaptability to resolve future ATM challenges. IATA recalled any changes must demonstrate a positive cost benefit case, with airline connectivity taken into account.

3.2.111 The meeting noted that the concept should be presented for consideration by the appropriate technical sub-group or working group of APANPIRG. In this case it should be the Asia/Pacific ATM Automation Systems Task Force (ATMAS/TF), under the Communications, Navigation and Surveillance Sub-Group of APANPIRG (CNS/SG) and in coordination with the ATM/SG. It was further noted that, while the ATMAS/TF operated under CNS/SG, it was essential that the ATM community actively engaged in the work of the Task Force.

Indonesia 5LNC Status and Progress (IP03)

3.2.112 Indonesia provided information on their progress in the registration and duplicate resolution of five-letter name codes (5LNCs), used to mark significant points on Air Traffic Services (ATS) routes and instrument flight procedures. To support their 5LNC-related actions in the ICAO Codes and Routes Designators (ICARD) application, Indonesia had developed a web-based application (http://pia.airnavindonesia.co.id/).

Indonesia PBN Approach Chart Identification Transition Plan (IP04)

3.2.113 The meeting was provided with information on Indonesia's progress in Performance-Based Navigation (PBN) approach chart identification transition. Indonesia's plan was aligned with the ICAO Regional Transition Plan, and had recognized ICAO Circular 353 *Transition Planning for Change to Instrument Flight Procedure Approach Chart Identification from RNAV to RNP*. However, Indonesia's plan would be revised to take into account the COVID-19 pandemic situation.

Operation of Unmanned Aircraft Systems within Indonesia National Airspace (IP05)

3.2.114 An update on the operation of Unmanned Aircraft Systems (UAS) in Indonesia's national airspace was provided to the meeting. Indonesia had established several regulations for UAS since 2015 including general provisions for registration, identification, operating rules and law enforcement. Information was provided on UAS operational authorizations, operations within Indonesian airspace, and oversight of UAS operations.

Implementation Status of Fatigue Management System for ATCOs (IP06)

3.2.115 Republic of Korea provided information on the implementation status of their Fatigue Risk Management System (FRMS) for Air Traffic Control Officers (ATCOs), in accordance with the provisions of the 14th Edition of ICAO Annex 11 – *Air Traffic Services*, which were applicable from 05 November 2020. In the years 2018 to 2020 Republic of Korea had conducted studies on measures to introduce a FRMS and empirical research supporting the FRMS, and a development project for a web-based FRMS, based on prescriptive limitation regulations. Republic of Korea encouraged States to share their experience and challenges in implementing a FRMS for ATCOs.

…….

Terms of Reference of the AIS-AIM Implementation Task Force (AAITF)

The objectives of the Task Force are to:

a) study means of aeronautical data management by civil aviation authorities and/or ATS providers in other regions including the aeronautical information exchange model (AIXM) and the electronic AIP (eAIP), promote the implementation of these methods/models in the Asia/Pacific Region;

b) examine the means of aeronautical data exchange used in other regions and application in the Asia/Pacific Region;

c) assist States to implement Quality Management Systems for aeronautical information in an expeditious manner;

d) develop training material and conduct workshops on the Guidance Manual for AIS in the Asia/Pacific Region;

e) develop guidance material for Static Data Procedures and the AIS Automation Plan;

f) review and update the Guidance Manual taking into account amendments to ICAO SARPs, procedures and guidance material;

g) monitor and review technical and operating developments in the AIS field especially in the area of automation and database management; and

h) monitor the transition from AIS to AIM, and in particular monitor development of the replacement of Annexes 4 & 15, PANS-AIM (Doc 10066) and guidance documents under development by ICAO.

To achieve the above objectives, the Task Force shall consider:

1. results of the ICAO Information Management Panel (IMP);

2. amendments to Annex 4, Annex 15, PANS-AIM, the AIS Manual (Doc 8126), and the Aeronautical Chart Manual (Doc 8697); and

3. revisions to the EUROCONTROL *Operating Procedures for AIS Dynamic Data* (OPADD); and

4. implementation of the regional priorities and the performance objectives of the Asia/Pacific Seamless ~~ATM~~ ANS Plan.

The Task Force will report to the ATM Sub-Group of APANPIRG

(Adopted by the 14th Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/14), 2003, and most recently amended by ~~the 20th and 21st Meetings of the ATM/AIS/SAR/SG and the 4th Meeting of the ATM/SG~~ APANPIRG/31, 2020)

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.3: RASMAG

RASMAG/25 Outcomes (WP11)

3.3.1 The Tenth Meeting of the FANS Interoperability Team-Asia (FIT-Asia/10) was held by Video Teleconference from 03 to 06 August 2020.

3.3.2 The Twenty-Fifth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/25) was held from 27 to 30 October 2020 by Video Teleconference (VTC) from the ICAO Asia and Pacific Regional Office, Bangkok, Thailand. A total of 117 participants attended RASMAG/25 from Australia, Bangladesh, Cambodia, China, Hong Kong China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, New Zealand, Philippines, Republic of Korea (ROK), Singapore, Sri Lanka, Thailand, United States of America (USA), Viet Nam, IATA, IFALPA and ICAO. A total of 40 Working Papers (WPs), five Information Papers (IPs) and three flimsies were presented.

3.3.3 The RASMAG/25 Report is available on the ICAO APAC Regional Office website at: https://www.icao.int/APAC/Meetings/2020%20RASMAG25/Final%20Report%20RASMAG25.pdf

Note: airspace safety estimates are stated in terms of fatal accidents per flight hour (fapfh).

FIT-Asia Meeting Outcomes

3.3.4 The improvement in the submission of Problem Reports (PRs) that was noted at FIT-Asia/9 continued at FIT-Asia/10. A total of 66 PRs had been raised between July 2019 and June 2020, compared with 45 in the previous 12-month period. However, only six States had provided their annual survey response for 2020 reporting to FIT-Asia/10: Australia, China, Philippines, Singapore, Thailand and Viet Nam.

3.3.5 PBCS non-compliance report templates had been intended for ANSPs to inform the relevant Regional Monitoring Agency (RMA) of aircraft/aircraft operators where data link performance did not comply with specifications. A revised non-compliance report form template was proposed to FIT-Asia/10 in order to include additional information, to harmonize with the template already adopted in the North Atlantic (NAT) Region, and to use MS Excel format to facilitate data handling by the RMA. RASMAG/25 agreed to the following Conclusion developed by the FIT-Asia/10:

Conclusion RASMAG/25-1: Revised PBCS Non-Compliance Report Form Template

That, the PBCS Non-Compliance Report Form Template at **Appendix C to the RASMAG/25 Report** be uploaded to the Asia/Pacific Regional Office website, to replace the previous template.

3.3.6 Key analysis of the Required Surveillance Performance (RSP) data had indicated that performance requirements for RSP180 had not been met for messages delivered via High Frequency (HF), or messages delivered via Iridium and some Inmarsat paths.

3.3.7 Analysis of the Required Communications Performance (RCP) data indicated that performance requirements for RCP240 had not been met for Controller Pilot Datalink Communications (CPDLC) transactions delivered via High Frequency (HF) and mixed media, for CPDLC transactions delivered via Iridium paths in a few Asia/Pacific FIRs, and also for some aircraft operators observed below the RCP240 95% requirements within multiple APAC Flight Information Regions (FIRs).

RASMAG/25 Outcomes

3.3.8 The Regional Monitoring Agencies Coordination Group (RMACG, VTC, July – August 2020) had urged State CAAs to liaise with State Aircraft operators (such as military aircraft) regarding the verification process and status of RVSM approvals. Those aircraft with no RVSM approvals were strongly advised not to file 'W' in item 10 of the ICAO Flight Plan in order to prevent their flight plans from being rejected by EUROCONTROL.

3.3.9 RASMAG/25 had endorsed the updated Minimum Monitoring Requirements (MMR) in accordance with the following Conclusion:

Conclusion RASMAG/25-2: RVSM MMR Update

That, the Reduced Vertical Separation Minimum (RVSM) Minimum Monitoring Requirement (MMR) update at **Appendix D to the RASMAG Report** be utilized by Regional Monitoring Agencies (RMAs) and States as appropriate.

3.3.10 **Figure 3.3-1** is an Asia/Pacific RVSM TLS compliance overview, as at RASMAG/25:

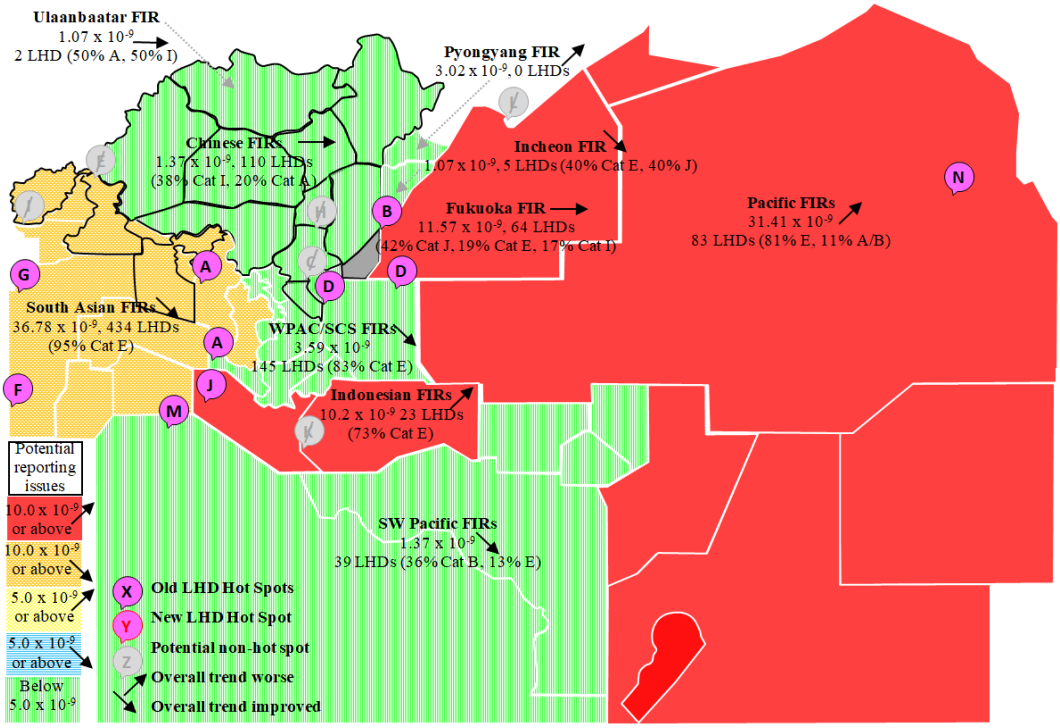


Figure 3.3-1: Asia/Pacific RVSM TLS subregion compliance reported to RASMAG/25

3.3.11 **Table 3.3-2** summarises the following RMA airspace subdivision aspects:

RMA Airspace Subdivision	Safety trend	Notes
Chinese FIRs	No change	Potential ATC reporting issues
Incheon FIR(excl. AKARA)	Improving	AKARA would dramatically worsen
Indonesia FIRs	Worsening	Improving reporting
Fukuoka FIR	No change	Still affected by the Manila FIR
Pacific FIRs	Worsening	Dramatic increase in CAT E LHDs
Pyongyang FIR	Worsening	Insufficient traffic to judge compliance
South Asia Indian Ocean FIRs	Improving	Still has the second worst hot spots
Southwest Pacific FIRs	Improving	Best performing APAC airspace
Ulaanbaatar FIR	No change	Potential ATC reporting issues
W Pacific/Southeast Asia FIRs	Improving	Second best performing APAC airspace

Table 3.3-2: Airspace Vertical Safety Performance Overview

3.3.12 **Table 3.3-3** provides a comparison of the APAC RVSM risk as a measure against the TLS by grouped FIRs, according to the RMA responsibilities for airspace. Over the past six years, APAC's TLS compliance for RVSM had been poor overall, averaging 40% when measured by the grouped FIRs. However, of the 26 Flight Information Regions (FIRs) that achieved TLS, 13 FIRs had potential reporting issues. Therefore, the compliance rate may be significantly worse than reported.

3.3.13 Measures taken to improve adherence to the TLS in the past six years had yielded localised improvements, but overall had failed to produce a positive result for the APAC Region.

	2014	2015	2016	2017	2018	2019
FIRs	53%	32%	51%	16% (8 FIRs)	37% (18 FIRs)	53% (26 FIRs)

Table 3.3-3: Comparison of Regional RVSM TLS Achievement

Hot Spot Summary

3.3.14 **Table 3.3-4** provides a summary of the Hot Spots.

ID	Involved FIRs	Identified	Remarks
A1	Kolkata/Chennai/Dhaka – Yangon	2015	Potential non-hot spot
A2	Chennai – Kuala Lumpur	2015	LHDs increased
B	Incheon	2015	AKARA Corridor
D	Manila – all adjacent FIRs	2015	LHDs reduction
F	Mogadishu – Mumbai	2015	LHDs reducing
G	Sana'a/Muscat – Mumbai	2015	Cat. E LHDs (Sana'a improved)
J	Jakarta – Singapore/Kota Kinabalu	2018	Minor, Cat. E LHDs
M	Colombo - Melbourne	2019	Potential non-hot spot
N	Oakland USA – Hawaii CEP	2019	Cat. E LHDs

Table 3.3-4: Comparison Summary of LHD Hot Spots

3.3.15 The Pacific Approvals Registry and Monitoring Organization (PARMO) had provided an RVSM safety report for **Hot Spot B** (AKARA-FUKUE Corridor airspace containing ATS route A593 with crossing routes Y711 and Y722/B576 within the Incheon FIR). The AKARA corridor airspace involved four FIRs (Fukuoka, Incheon, Taibei and Shanghai), four RMAs and had a unique, Annex 11 non-compliant arrangement, whereby two ATC units provided services within the same airspace.

3.3.16 There had been twelve reported Large Height Deviations (LHDs) during 2019 that contributed towards the estimate of operational vertical risk, with a total of 35.9 minutes of duration at an incorrect flight level and 10 flight levels crossed without an ATC clearance. This had resulted in a 57% increase in estimated vertical risk to **247.0×10^{-9}** (**Figure 3.3-5**).

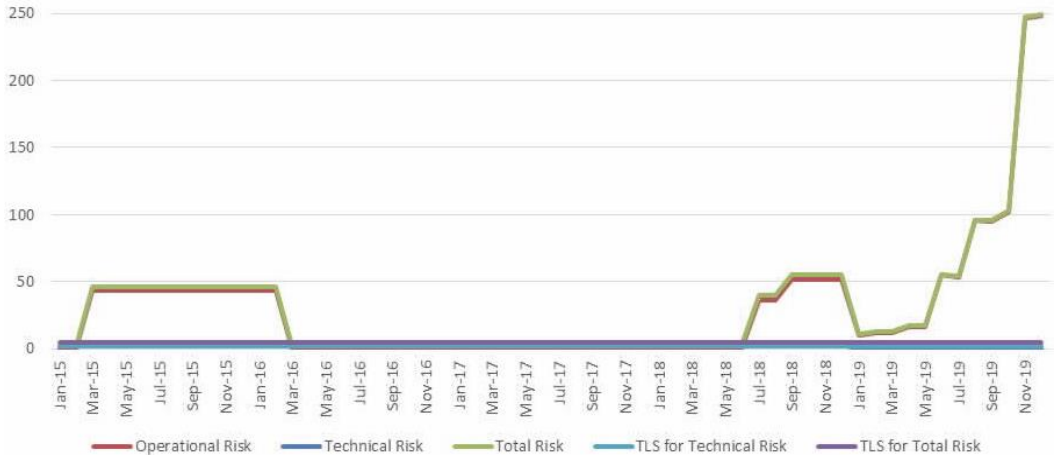


Figure 3.3-5: AKARA Twelve-month Rolling Vertical Collision Risk Estimate, 2015– 2019

3.3.17 The numbers of reported LHDs within this airspace had been increasing rapidly, with only three in 2015 and 2016, and none in 2017. After discussions at RASMAG on the need for improved safety reporting, a major increase of 19 for 2018 was recorded, and again in 2019 29 LHDs were recorded, 16 of which were Category E (55%), seven were Category D (24%) and one each for Category A and Category B (7% together).

3.3.18 Locations of the LHD events are indicated in **Figure 3.3-6**.

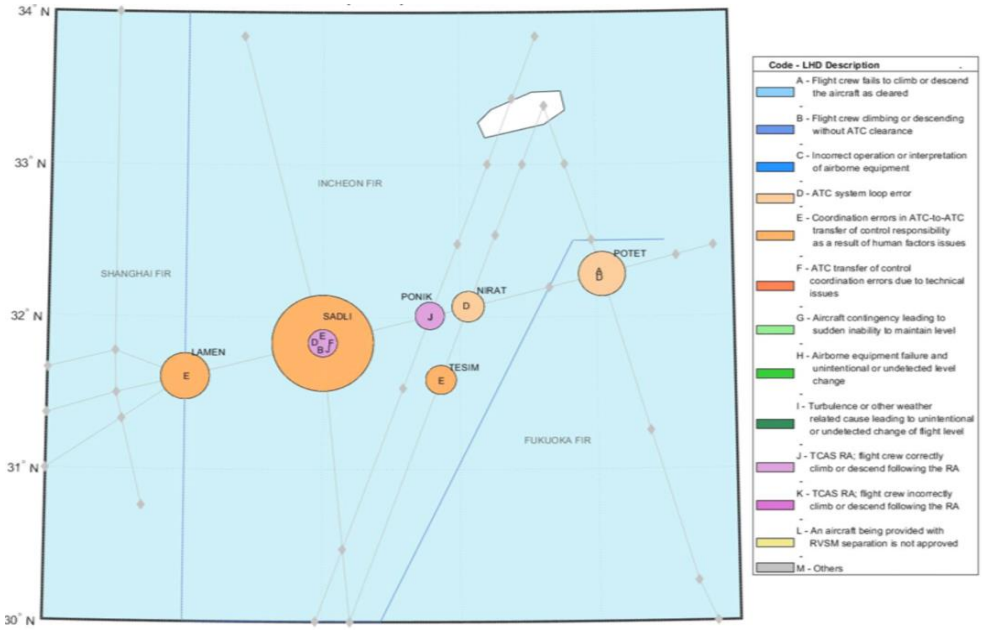


Figure 3.3-6: Locations of 2019 Reported AKARA Corridor LHDs

3.3.19 ICAO had thanked PARMO for its work to consolidate the safety data from four RMAs, noting that as a result of greater scrutiny and more reporting, the vertical risk estimate result exceeded the TLS by a factor of nearly 50 times, significantly more than an order of magnitude.

3.3.20 The ROK had provided comprehensive information on its analysis process of the proposed changes to the AKARA – FUKUE Corridor arrangement, and its capability to provide ATS within the airspace concerned. The ROK had noted that after a period of slow progress due to the COVID-19 pandemic, the States concerned had resumed negotiations. The ROK stressed that while the pandemic had temporarily reduced the air traffic volume, safety concerns may resurge at any time with the expected increase of traffic in the future. As such, ROK had stated that they were convinced that the timely transition to the new ATS structure should occur now.

3.3.21 At APANPIRG/31, the ROK commented that despite a delay caused by the COVID-19 pandemic, the ROK were having productive negotiations with China and Japan. ROK anticipated safety improvements to the AKARA – FUKUE Corridor structure and arrangements between the concerned States in the near future.

3.3.22 LHD **Hot Spot F** (Mogadishu – Mumbai) and **Hot Spot G** (Sanaa/Muscat – Mumbai) remained as Hot Spots. In 2019, the operational risk of these Hot Spots had accounted for **25.65×10^{-9}**, which was 71% of the SAIO area's total risk. The 2019 operational risk in South Asia/Indian Ocean (SAIO) airspace was dominated by LHDs at Mumbai – Muscat interface. Out of 16 long duration LHDs in SAIO airspace, 12 LHDs occurred at this interface, accounting for 38% of the total operational risk in this sub-region. The majority of LHDs between Muscat and Mumbai were Category E, with a sub-category of 'No or Late FL Revision' and 'Negative Transfer'. The poor communication services and lack of surveillance coverage at this interface worsened the situation, due to the slower identification that led to long-duration occurrences.

3.3.23 Most of the LHDs and operational risk within Southeast Asia airspace was associated with **Hot Spot D** (Manila and all adjacent FIRs). From late 2018, the number of LHDs and operational risk in SEA airspace began reducing as the capabilities of the new ATM system were implemented, including enhanced Very High Frequency (VHF) radio, radar and ADS-B coverage, and new Air Traffic Control (ATC) sectors. The Automatic Dependent Surveillance-Communication/ Controller Pilot Datalink Communication (ADS-C/CPDLC) implementation in oceanic airspace, Air Traffic Services Inter-facility Datalink Communication (AIDC) implementation with Hong Kong FIR, Singapore FIR and Taipei FIR had commenced as indicated in **Figure 3.3-7**.

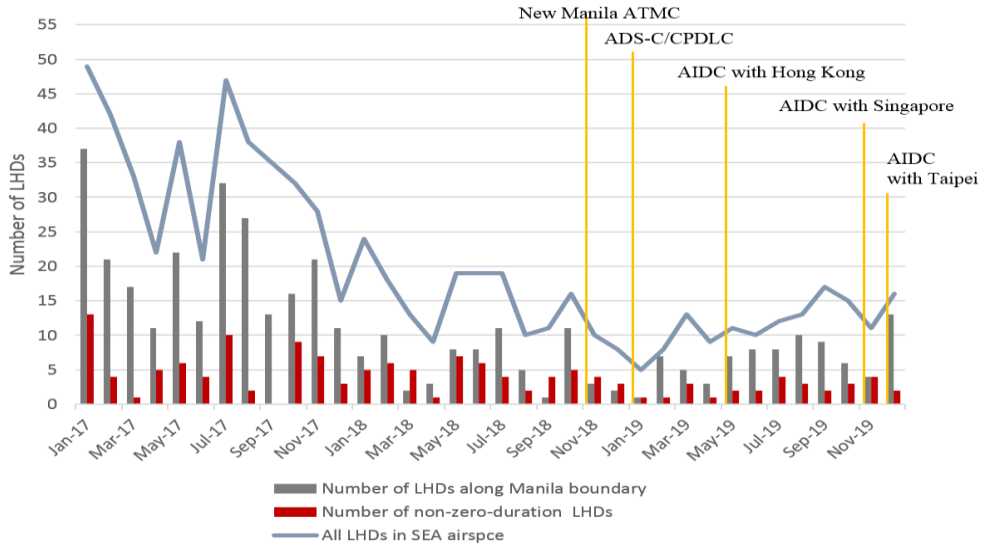


Figure 3.3-7: LHDs, Manila FIR Boundary, 2017 – 2019

3.3.24 With regard to Category D (*ATC system loop error*) events, the Japan Airspace Safety Monitoring Agency (JASMA) had provided more detailed analysis to the meeting after ICAO asked whether English Language Proficiency (ELP) might be an issue. While acknowledging the potential role of ELP, Japan noted that some of these incidents were due to similar call signs.

3.3.25 In response to a query from ICAO, IATA clarified that its successful similar call sign initiative that had been implemented in the Middle East (MID) Region had not been able to progress in the APAC Region. One of the reasons for this was the reluctance of aerodrome operators to implement change until an automated tool was available to accommodate alphanumeric call signs.

3.3.26 Noting the grave safety risks from such occurrences, and noting the endorsement by the ATM/SG/8 and the AOP/SG/4, APANPIRG/31 agreed to the following Conclusion:

Conclusion APANPIRG/31/11: Alphanumeric Call Sign Initiative	
What: Noting: 1) the extreme safety risks associated with pilot-ATC miscommunication and the number of Category D (ATC Loop Error) Large Height Deviations (LHDs); 2) APANPIRG Conclusion 27/15. ATMSG Conclusions 5-5 and 5-6 regarding the Asia Pacific Alpha Numeric Call-Sign (ANCS) call sign project; and 3) alphanumeric call signs were a well-established call sign confusion mitigation, that: leading Air Navigation Service Providers (ANSPs) and aerodrome operators, in coordination with CANSO and ACI, were urged to consider a trial to identify and overcome any barriers for the implementation of alphanumeric call signs, with a view to developing a project for the Asia/Pacific (APAC) Region.	Expected impact: ☒ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical

Why: The Asia Pacific ANCS call-sign project had not been universally supported by aerodrome operators and ANSPs thus far.	Follow-up: ☐Required from States
When: 15-Dec-20	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: RASG	

Non-RVSM Approved Aircraft

3.3.27 **Table 3.3-8** compared the non-RVSM airframes reported by each RMA annually:

Report	AAMA	China RMA	JASMA	MAAR	PARMO	Total
RASMAG/23	5	20	9	43	38	115
RASMAG/24	5	4	17	34	1	61
RASMAG/25	2	24	6	26	9	67

Table 3.3-8: Trend of Non-RVSM Airframes Observed by Asia/Pacific RMAs

Regional Horizontal TLS Compliance

3.3.28 The following Asia/Pacific En-Route Monitoring Agency (EMAs) reported performance-based horizontal risk assessments as follows, which all met the TLS of 5.0×10^{-9} (**Table 3.3-9**):

ATC Separation	EMA	2018 Estimated Risk	2019 Estimated Risk
50NM Lateral	BOBASMA	2.05×10^{-9}	1.59×10^{-9}
	JASMA	0.05×10^{-9}	1.45×10^{-9}
	PARMO	-	-
	SEASMA	0.52×10^{-9}	0.012×10^{-9}
30NM Lateral	PARMO	0.16×10^{-9}	3.35×10^{-9}
50NM Longitudinal	BOBASMA	4.21×10^{-9}	4.97×10^{-9}
	PARMO	2.22×10^{-9}	-
	SEASMA	0.38×10^{-9}	0.38×10^{-9}
30NM Longitudinal	BOBASMA	-	-
	JASMA	0.001×10^{-9}	0.015×10^{-9}
	PARMO	4.08×10^{-9}	4.08×10^{-9}

Table 3.3-9: Comparison of Horizontal Risk Assessments

APAC Consolidated LTHM Burden Estimate Update

3.3.29 Thailand presented an overview of LTHM compliance status in the Asia/Pacific Region, including assessments of Asia Pacific RMAs: Australian Airspace Monitoring Agency (AAMA), CHINA RMA, JASMA, Monitoring Agency of the Asian Region (MAAR) and PARMO. The assessment, which was based on RVSM approval data as at 30 October 2020, yielded a remaining monitoring burden of 379, a 20% increase from 2018:

- China RMA (22%), JASMA (2%), and PARMO (3%) States had reduced their remaining their monitoring burden, with China having the biggest improvement; and
- MAAR (54%) and AAMA (19%) States had an increased remaining monitoring burden, mainly due to aircraft being unable to be monitored using Enhanced Global Navigation Satellite System Monitoring Units (EGMUs).

3.3.30 The MAAR had a total of 206 aircraft to be monitored. The total number of aircraft remaining to be monitored in the APAC Region had risen by 20% to 379, with Afghanistan being the highest at 85%.

3.3.31 As Malaysia's remaining monitoring burden had significantly dropped to below 30%, MAAR proposed to remove it from the APANPIRG List of Deficiencies for LTHM compliance.

3.3.32 During 2019 – 2020, seven States – Afghanistan, Bhutan, India, Indonesia, Nepal, Pakistan and the Philippines had a remaining monitoring burden over 30% (**Table 3.3-10**). However, with the unavailability of EGMU services due to travel restrictions during the COVID-19 pandemic, MAAR proposed to delay proposing new Deficiencies for States until RASMAG/26's review.

State	2017%	2018%	MMR	Burden	2019%
Afghanistan (MAAR)	**38%**	**36%**	13	11	**85%**
Pakistan (MAAR)	**69%**	**56%**	28	13	**46%**
India (MAAR)	**30%**	**25%**	245	106	**46%**
Nepal (MAAR)	**0%**	**0%**	11	5	**45%**
Philippines (MAAR)	**30%**	**26%**	70	30	**43%**
Indonesia (AAMA)	**42%**	**21%**	57	24	**42%**
Bhutan (MAAR)	**0%**	**0%**	5	2	**40%**
Malaysia (MAAR)	**38%**	**40%**	72	19	**26%**
Myanmar (MAAR)	**36%**	**0%**	6	1	**17%**
Bangladesh (MAAR)	**44%**	**14%**	14	2	**14%**

Table 3.3-10: State Monitoring Burdens (red = liable for APANPIRG Deficiency)

Consolidated Asia/Pacific Safety Report

3.3.33 Thailand had provided a consolidated safety review and a comprehensive presentation of Asia/Pacific's airspace safety performance.

Safety Reporting

3.3.34 The MAAR had noted that measuring how well an organization reports hazards and incidents had been a challenge and the use of reported incident numbers as an indicator of reporting culture had limitations, due to many factors apart from the maturity of reporting cultures. Low number of reported incidents could be a result of the improvement in safety level or a result of poor reporting cultures.

3.3.35 MAAR had clarified that controllers tend to report LHDs only when affected by mistakes made by their neighbouring FIRs. In 2019, only 15% of all LHDs were reported by the AC that had made the error. ACCs with good reporting culture that submitted this type of LHD report were:

Singapore, Manila, Kota Kinabalu and Kuala Lumpur.

3.3.36 RASMAG/25 had noted that the following States had potential reporting issues:

a) Afghanistan, which did not report any LHDs during 2020;

b) China, which had reported an implausibly low percentage of Category E events (7 3% during 2018 and 7% in 2019);

c) India – Delhi and Kolkata FIRs (although Mumbai and Chennai had made distinct improvements); and

d) Mongolia had a rate of reported LHDs per hour that was very low, many factors less than that expected.

3.3.37 Notwithstanding the potential safety reporting issues noted, the MAAR advised that there were some signs of reporting culture improvement, including positive trends in India. Area Control Centres (ACCs) that had always submitted a NIL report were:

Phnom Penh, Hong Kong, Vientiane, Taipei, Hanoi, Ho Chi Minh, Dhaka, Karachi and Ulaanbaatar.

3.3.38 Significant improvements in safety reporting had been noted in within the AKARA – FUKUE Corridor. Previously, some States had insisted that there were no safety issues within the Corridor, and it had been very rare to receive safety incident reports. RASMAG/25/WP14 illustrated data that showed the Corridor was a Hot Spot with very high latent safety risks.

3.3.39 AAMA had also noted that Indonesia had probably improved its safety reporting culture.

3.3.40 It was appropriate to remind States, even those which had taken significant positive steps to improve reporting, to continually monitor their reporting culture and systems to optimise reporting. Experience from developed nations had shown that educating operational personnel was not enough to achieve the open reporting objective of the 'aviation culture', as described in the *Asia/Pacific Seamless ATM Plan*.

3.3.41 In order to be more proactive, ICAO recommended that RMAs and EMAs better analyse safety data to identify potential under-reporting and undertake safety culture surveys and audits to monitor safety reporting culture.

3.3.42 RASMAG/25 had agreed to the following Decision on safety reporting, as part of RMA/EMA safety reports.

Decision RASMAG/25-4: Safety Reporting Assessments

That, RMAs and EMAs will include within their vertical and horizontal safety reports to RASMAG an assessment of the safety reporting culture of the States concerned (including 'Just Culture'), and specifically, whether safety reports for events such as LHDs were consistently being made by pilots and ATC.

Summary Report of COVID-19 Identified Airspace Risk Occurrences

3.3.43 Singapore presented an analysis of LHDs and Gross Navigation Errors, the impact of COVID-19 on ATC operations, and associated mitigations. Examples of lessons learnt were the:

a) use of available aide memoirs as reminders to controllers of any outstanding task such as checking for AIDC transfer failures at boundary points; and

b) minimisation of last minute flight levels revisions near transfer boundaries.

3.3.44 Due to the reduction in air traffic as a result of the COVID-19 pandemic, key safety hazards had been identified. The corresponding mitigations for ATC were as follows:

a) mental fatigue, reduced alertness and distractions were mitigated by merging ATC positions to increase the sector area and maintain a healthy level of stimuli;

b) limited On-Job-Training (OJT) opportunities and challenges making realistic and accurate assessments of trainees' competency were addressed through OJT revision and a validation assessment framework to allow the use of ATC simulators; and

c) skill fade of controllers related to the handling of pre-COVID traffic volume and scenarios was managed with a revised programme for proficiency checks and continuous training (comprised of various exercises using pre-COVID traffic volume and complexity which are made available at all simulators).

ATM and Airspace Safety Deficiencies List

3.3.45 The meeting reviewed the APANPIRG ATM and Airspace Safety Deficiency List and agreed to make the following recommendations to APANPIRG/31:

a) deletion of the Deficiency for Myanmar related to PRs not being provided to the Central Reporting Agency (CRA);

b) deletion of the Deficiency for Bhutan and Lao People's Democratic Republic (PDR) related to non-provision of the annual RVSM approval snapshot;

c) deletion of the Deficiency for Bangladesh, Pakistan and French Polynesia related to non-provision of the TSD and LHD;

d) deletion of the LTHM Deficiency for Malaysia; and

e) amendment of the LTHM Deficiency for Pakistan to reflect the remaining monitoring burden of 46% and for Afghanistan for failing to submit the annual RVSM approval snapshot for 2018 and 2019.

Production of the Asia/Pacific Region Combined PBCS Monitoring Report

3.3.46 The USA had presented a recommended process for the production of the Asia/Pacific Region Combined Performance Based Communications and Surveillance (PBCS) Monitoring Report, proposing the retention of a PBCS Report format harmonized with other ICAO regions, and the biennial rotation of the report generation responsibilities amongst States and Monitoring Agencies. It had been noted that the consolidated performance report format currently used by FIT-Asia was also used in the North Atlantic (NAT) Region, and was also used by informal Pacific groups.

3.3.47 Rotating responsibility for the production of the report would assure that, over time, multiple States and organizations would gain the knowledge and develop the skillset to improve system performance. Ideally, a biennial rotation would allow for the outgoing State/Agency to assist the incoming organization in the first year, followed by independent production in the second year.

3.3.48 RASMAG/25 had agreed to the following Decision:

Decision RASMAG/25-5: Rotational Responsibility for the Production of the Combined PBCS Monitoring Report

That, FIT-Asia will produce an annual Combined PBCS Monitoring Report, as follows:

1. responsibility for the report production will rotate biennially amongst volunteer States,
2. reporting Agencies, or other relevant stakeholders; the State, Reporting Agency or other stakeholder releasing responsibility for production of the report will assist the new report producer in the first year of their responsibility; and
3. until a report format is codified in ICAO documentation, producing organizations must assure the report content, format, and quality are consistent with similar reports in other ICAO regions.

……..

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

3.4 CNS Matters

3.4.1 APANPIRG/31 reviewed the outcomes of the Twenty Fourth Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/24) of APANPIRG held from 30 November to 4 December 2020 via video teleconference (WP/12). The meeting noted with appreciation on the work done and achievements by the CNS SG and its contributory bodies. The meeting discussed CNS related matters and took following actions on the report of CNS SG/24 meeting.

3.4.2 The full report and papers of the SG meeting are available on the following webpage: https://www.icao.int/APAC/Meetings/Pages/2020-CNS-SG24.aspx

3.4.3 The meeting noted that CNS SG/24 meeting had adopted following 8 Conclusions and 5 Decisions on technical and operational matters:

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

3.4.4 The meeting further noted that the CNS SG had reviewed the outcome of the **40th Session of ICAO Assembly** and identified a number of actions items related to CNS. Member States were encouraged to actively take follow-up actions on CNS related actions items resulted from the relevant meetings.

Aeronautical Fixed Service (AFS)

3.4.5 The Seventh Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/7) which was held from 21 to 23 July 2020 using VTC. The ACSICG/7 meeting reviewed the outcomes of the Seventh Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/7) and took follow-up actions.

3.4.6 The meeting noted the ATN/AMHS and AIDC implementation status in the APAC Region provided in *Appendix A* to CNS SG/24 meeting report.

Election of a co-chair of the ACSICG

3.4.7 Mr. Chonlawit Banphawatthanarak, Chief, Policy and Strategy Management Bureau of AEROTHAI was unanimously elected as co-chair of the ACSICG of APANPIRG.

Action taken on the Report of CRV OG/7 Meeting

3.4.8 The CRV OG/7 was held in ICAO Asia and Pacific Office from 20 to 22 January 2020.

3.4.9 The ACSICG/7 meeting recognized the challenges and difficulties faced by States/Administrations under current pandemic situation and recommended to postpone the target year of regional implementation of CRV from 2020 to end of 2021. PCCW Global Limited (PCCWG), as the contractor for the provision of CRV infrastructure and services, also agreed to extended target year for regional CRV implementation from 2020 to 2021 without changing terms and conditions of their technical/price offers.

3.4.10 The meeting recapped the Action Item DGCA/54/20 in 2017 putting up 2020 as the target date for CRV implementation for all ANSP to optimize cost benefit and adopted a conclusion as following:

<table>
<tr><td colspan="3">Conclusion APANPIRG/31/12 (CNS SG/24/1) - Target Year of CRV Implementation in APAC Region</td></tr>
<tr><td colspan="2">What: That, set and monitor 2021 as the target for CRV implementation for all ANSPs.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒Ops/Technical</td></tr>
<tr><td>Why: Considering the challenges and difficulties faced by States/Administrations under current pandemic situation and recommended to postpone the target year of regional implementation of CRV from 2020 to end of 2021 and further align with follow up actions on Common Ground/Ground Telecommunication Network stated in the Beijing Declaration.</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
</table>

When:	16-Dec-20	Status:	Adopted by PIRG
Who:	☒ Sub groups ☒ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:		

3.4.11 According to the latest updates in November 2020 from PCCWG, twelve States/Administrations have joined CRV and implemented operations: Australia, Bhutan, China, Hong Kong China, Fiji, Japan, New Zealand, Philippines, PNG, Republic of Korea, Singapore and USA. Additional eight States/Administration have plan to join CRV: France-New Caledonia and Polynesia, India, Indonesia, Malaysia, Nepal, Russia, Thailand. The Updated CRV Implementation Status Table is provided in Appendix B to the CNS SG/24 meeting report.

CRV for AMHS Centres of the Russian Federation Interacting of COM Centres in the APAC Region

3.4.12 Russian Federation provided updates on their plan and progress of joining CRV at number of centres (Moscow, Khabarovsk, Irkutsk) in Russia to interact with COM centres (Fukuok, Beijing and Ulaanbaatar) in the APAC Region as well as COM centres in USA (Salk Lake City and Anchorage). In following up the outcome of COM Coordination Meeting in May 2019, Russian Federation is considering options to join CRV at those designated entry/exit points in Russia with entry/exit points in the APAC Region.

MPLS/IP Based Inter-Regional Connection

3.4.13 The CRV OG meeting agreed to a proposal to develop a high-level concept on the interconnection of CRV with other regional network such as REDDIG/MEVA/PENS. A number of States that connecting to the CRV are also planning to connect to other regional networks for cost reduction and improve efficiency. Noting these requirements, the CRV OG and PCCWG will enhance and trigger early discussions with these regional networks at future opportunity to consider how the CRV can potentially be interconnected with other regional networks.

CRV and AFS Safety and Protection planning

3.4.14 In following up the outcome of CNS SG/23 meeting, the AFS Safety and Protection joint working group meeting scheduled for 21 to 23 April 2020 in Nevada, USA has been postponed without a firmed date. The CRV OG/7 meeting considered necessary and timely to address safety and security concerns as more and more AFS and other new applications being transferred to and exchanged over CRV. This CRV OG/7 meeting was also planning to discuss inter-network connection as indicated in the paragraph above.

Proposal to use CRV for Space based ADS-B

3.4.15 One prime purpose for using CRV for delivery of surveillance data from space-based ADS-B is to reduce the need for point-to-point circuits and would result in lower data communications costs for ANSPs. PNG Air Services Limited (PNGASL) has contracted for the supply of space-based ADS-B data from Aireon LLC and is intending to contract for a CRV connection in early 2020. Indonesia expressed support to PNG's proposal to use CRV for distribution of space-based ADS-B data.

Report on the readiness status of AMHS to support IWXXM service by November 2020

3.4.16 The following ANSPs should be able to support IWXXM using their respective AMHS with FTBP capability: Australia; Bangladesh; Bhutan; Cambodia; China; Hong Kong, China; Macao, China; Fiji; India; Indonesia; Japan; Republic of Korea; Myanmar; Nepal; New Zealand; Pakistan; Philippines; Singapore; Sri Lanka; Thailand; and USA.

3.4.17 The ACSICG/7 meeting recommended that States with designated BBIS (viz Australia, China, Hong Kong, China, Fiji, India, Japan, Singapore, Thailand and USA) should increase their respective connection bandwidth to greater than 64kbps if feasible and applicable.

APAC regional Strategies on AMS and Air-Ground Data Link

3.4.18 As assigned by the CNS SG/23 in 2019, China took the lead and worked together with Australia, Japan and USA to review the regional AMS strategy adopted by APANPIRG in 2013 and the Datalink strategy adopted by APANPIRG in 2005. The draft on the revised strategies was distributed among members and discussed through a teleconference on 1 July 2020. The ACSICG/7 meeting reviewed the draft on the revised strategies and further discussed some additional changes proposed by Singapore. The FIT-Asia/10 noted the revision and the CNS SG proposed to APANPIRG for further consideration. With aforementioned, the meeting adopted the following Conclusion:

<table>
<tr><td colspan="3">Conclusion APANPIRG/31/13 (CNS SG/24/2-ACSICG/7/1) - the Revised Regional Strategies on AMS and Datalink</td></tr>
<tr><td colspan="2">What: That, the revised Aeronautical Mobile Service (AMS) Strategy for the Asia/Pacific Region provided in Appendix A to the Report on Agenda Item 3.4 and the revised Strategy for Implementation of the Air-Ground Data Link in the Asia/Pac Region provided in Appendix B to the Report on Agenda Item 3.4 be adopted.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒Ops/Technical</td></tr>
<tr><td>Why: Need to update the regional strategies on AMS and Datalink based on the latest developments</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒ Sub groups ☒ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

Amendment to AFTN/AMHS-based ATFM Interface Control Document (ICD)

3.4.19 The Tenth Meeting of the Asia/Pacific ATFM Steering Group (ATFM/SG/10, Video Teleconference, 4 to 8 May 2020) proposed amendment to the AFTN/AMHS-based ATFM ICD which was endorsed by ACSICG and adopted by CNS SG/23 meeting in 2019. Subsequent to the ATFM/SG/10 meeting, the Secretariat conducted a further editorial review of the ICD, in consultation with the ATFM/SG/10 Chair and the AMNAC Technical Sub-group. The document was further amended to correct some errors and minor omissions. In view of the foregoing, the SG meeting adopted the following Conclusion: **Conclusion CNS SG/24/3(ACSICG/7-2 (ATFM/SG/10-3)) - Amendment of the AFTN/AMHS-based Interface Control Document (ICD) for ATFM.**

Draft CRV Operations Manual

3.4.20 New Zealand presented update on the CRV Operations Manual after the ACSICG/7 meeting, as the outcome of the ACTION ITEM of the meeting. Since then, several ad hoc meetings have been held. The main focus has been on the Request Fulfillment Process and procedures as this provides the information and directions required to join, leave or make changes the CRV network. This has also led to the need to have a CRV landing page on the ICAO APAC and MID regional websites. This landing page will provide an overview of CRV and who to contact. An initial request will be send to the APAC CRV Portal Administrator requesting to join, leave or add a new connection to CRV. Upon receipt of the request, a registration form is provided and check the content is completed. Once published, the CRV OG will manage changes to the Operations Manual and other CRV related documentation through the Document Administration Process and Procedure which is detailed in the Operations Manual.

3.4.21 With the abovementioned, the SG meeting adopted the following Conclusion: **Conclusion CNS SG/24/4 - Publishing of the CRV Operations Manual** and endorsed the following Decision: **Decision CNS SG/24/5 - CRV landing page on the ICAO APAC website**. The adopted CRV Operations Manual is provided in **Appendix C** to the Report on Agenda Item 3.4.

Updates on APAC Implementation of IWXXM Exchange over AMHS

3.4.22 The SG meeting noted that a majority of APAC States/Administrations had not yet reported full implementation of IWXXM format, in accordance with the standards in ICAO Annex 3, applicable from 5 November 2020. IWXXM exchange requires AMHS (with FTBP) and the use of unique AMHS addresses. The Regional OPMET Centres (ROCs) will be responsible for distribution of IWXXM formatted OPMET data in APAC. An online register of the status of IWXXM exchange capabilities in APAC Region will facilitate IWXXM exchange between capable ROCs.

3.4.23 The SG meeting requested the MET SG and CNS SG to enhance mutual coordination and sharing outcomes of related survey and seminar/workshop, and encouraged States/Administrations to expedite responding to the ICAO's survey as soon as possible before APANPIRG/31 meeting, and the contributory body of MET SG (Meteorological Information Exchange Working Group (MET/IE WG)) should work collaboratively with ACSICG for a way forward in APAC Region.

Presentation of PCCW Network Based IWXXM
Translation and Exchange Services

3.4.24 Fiji and PCCWG described PCCW IWXXM Translation and Exchange Services. They proposed that it could serve as an alternative solution for member States to fulfil the exchange of IWXXM messages.

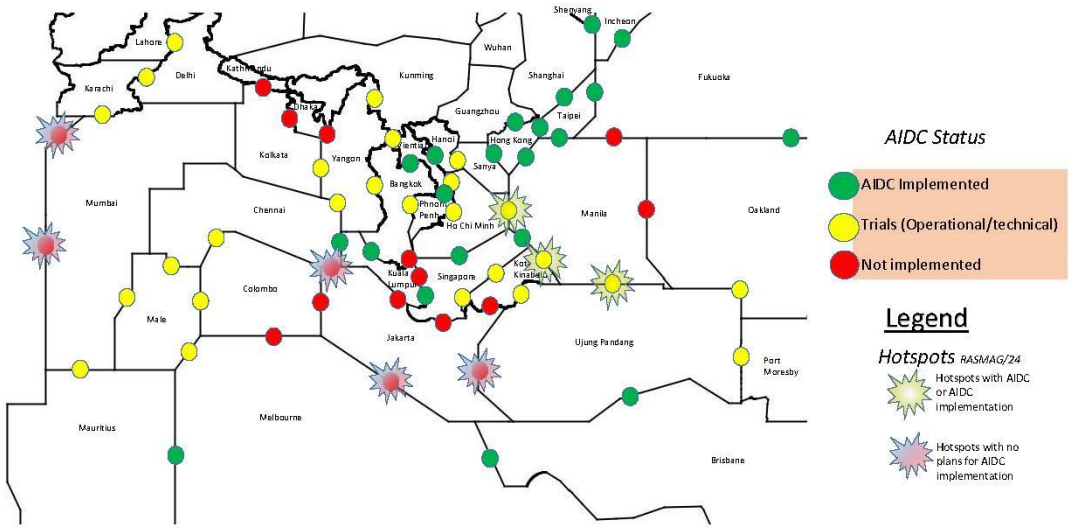
Report of the Sixth Meeting of the Asia Pacific AIDC Task Force

3.4.25 The Sixth meeting of the ATS Inter-facility Data Communication Task Force (APA TF/6) noted that AIDC implementation in South China Sea sub-region had been satisfactory while further efforts by States in the Bay of Bengal sub-region are required. The summary of the new AIDC connections implemented since the APA TF/5 meeting is listed below:

- Automatic handling over based on OLDI ICD between Shenyang ACC and Khabarovsk ACC implemented in October 2019 over a dedicated line;
- AIDC operational implementation between Kuala Lumpur ACC and Chennai OCC came into effect on 1 April 2020;
- Operational AIDC between Singapore ACC and Kuala Lumpur ATCC with limited messages set was implemented on 1 November 2019;
- Operational AIDC between Bangkok ACC and Kuala Lumpur ATCC with limited messages set was implemented on 14 March 2020;
- Operational AIDC between Bangkok ACC and Vientiane ACC with 5 messages set was implemented on 14 July 2020;
- AIDC service between Manila ACC and Hong Kong ACC implemented on 23 May 2019;
- AIDC service between Manila ACC and Singapore ACC implemented on 1 November 2019; and
- AIDC service between Manila ACC and Taipei ACC implemented on 5 December 2019.

3.4.26 The APA TF/6 meeting encouraged States/Administrations concerned to continue work bilaterally to expedite implementation of those planned AIDC connections as priorities

identified by APANPIRG. The graphical map for quick and easy understanding of the regional AIDC implementation status is shown below.



APA AIDC Implementation Chart ver 2 (Jul 2020)

Collected AIDC Implementation Issues

3.4.27 The latest AIDC issues were presented to APA TF/6 meeting by Indonesia with support from India and Singapore. The APA TF/6 meeting considered that the issue table would continue to serve as a reference for other States. A summary of the 89 issues identified is shown in the Table below:

Fault Categories	APA TF/6 (2020)		
	Issues Reported	Closed	Open
a. Communication Link	9	3	6
b. ATM System	50	20	30
c. AIDC Message	17	15	2
d. Airspace Design/Procedures	8	4	4
e. Other	5	2	3
Total	**89**	44	45

3.4.28 The SG meeting appreciated the great contribution of the APA TF since its establishment including the guidance material and promotion on implementation. The SG meeting also agreed that the understanding on AIDC implementation may differ from the regional perspective and State's perspective, based on regional planning document or bilateral agreement between ATSUs. APA TF holds the view that the number of messages to be implemented in AIDC operation would be considered as far as practical. Regarding the AIDC/OLDI implementation between India and Oman, the meeting was informed that ATM automation system of Mumbai is capable to support AIDC and OLDI, inter-regional coordination between India and Oman may require escalation through ICAO APAC and MID Office.

Fourth Meeting of System Wide Information Management Task Force

3.4.29 The meeting noted the report of SWIM TF/4 meeting held from 3 to 6 November 2020 via VTC.

Election of Co-Chair of the Task Force

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

Review SWIM Task Force Programme and outstanding action items

3.4.31 The SWIM TF/4 meeting reviewed the development of SWIM TF's work plan and the updating of Action List with highlight on the restructure of the task assignment and numbering. The SWIM TF/4 meeting noted the information, considered the amendment as necessary, and therefore adopt the revised task structure through **Decision SWIM TF/4/1** - *Revised SWIM TF Task Group*.

An Approach for APAC Regional SWIM Implementation

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

3.4.33 The SWIM TF/4 meeting further discussed the technical capabilities of SWIM TI required to achieve interoperability during the transition period, such as: 1) The SWIM TI will have two interfaces that enable the exchange of information with both CRV-based legacy systems and SWIM-enabled systems; 2) SWIM-enabled systems need to receive/send different AFTN/AMHS message types (MET, AIS, and ATS) from/to CRV-based legacy systems according to information domain requirements; 3) The SWIM TI is able to decouple CRV-based legacy and SWIM-enabled applications from external systems that implement different communication protocols.

SWIM Technical Overview Centered around CRV

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

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

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

integration between ATFM and A-CDM were identified in FIXM ATMB ATFM Extension version 0.1.

SWIM Discovery Service (SDS): Introduction

3.4.36 United States (USA) and Republic of Korea (ROK) introduced the concept of a SWIM Discovery Service (SDS). The ability to search for and locate (discover) services offered by a growing number of independently developed and autonomously managed SWIM domains is highly important and is a precursor for achieving global information exchange. The Federal Aviation Administration (FAA) and Korea Airports Corporation (KAC) are collaborating in an effort to define and test an approach for enabling federated service discovery across geographical and organizational boundaries. The paper described SDS interaction patterns and discussed the contents of the Implementation Specification, including SDS behavior model, information model, resource model, interface requirements, and security requirements. The SWIM TF/4 meeting noted that the SDS approach is consistent with the federated registry architecture adopted at SWIM TF/3, and encouraged participants to collaborate on SDS development.

Security and Trust in the Context of SWIM Service Discovery

3.4.37 USA and ROK provided a discussion of Security and Trust in the Context of SWIM Service Discovery. The joint FAA and KAC effort to establish a SDS development and testing environment has identified the need to address issues of security and trust that might occur when multiple independently operated discovery services exchange information. The paper illustrated some of these issues using an example scenario (an end user wants to "find all operational flight services") that requires intercommunication among three different discovery services. It went on to explain that FAA and KAC are investigating using a federated identity management solution approach to secure the communication and showed how this approach could answer questions raised in the scenario. The paper also provided an overview of the latest relevant security technologies, and it discussed the proposed APAC Mutual Trust Infrastructure being developed as part of the Security Management subtask (Task 5) and its relationship to issues of trust between discovery services. The SWIM TF/4 meeting recommended that issues identified in the paper be addressed by the TF Governance task and TF Security Management task, and encouraged participants to collaborate further on this subject.

SWIM Service Category Taxonomy

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

Implementation Status of SWIM Discovery Service (SDS)

3.4.39 USA and ROK provided information on the Implementation Status of the joint FAA/KAC SDS effort. In October 2019, (FAA) SWIM and KAC began a collaborative effort to establish a virtual environment for conducting transparent and replicable development of discovery services for future deployment by APAC SWIM initiatives. The paper presented a list of FAA/KAC work items together with the current status of each item. Completed items include: a service registry for ROK SWIM, a SDS Specification v.1.0.0 (https://discovery.swim.aero/sds/1.0.0/), a Service

Description Model for JSON (SDM-J) (https://discovery.swim.aero/sdm-j/1.0.0/), and several SDS operations implemented. Remaining items include carrying out bi-directional testing of SDS operations and formally reporting the result of the joint effort to SWIM APAC TF/4.

FF-ICE/R1 Service Validation and Implementation

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

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

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

Regional Coordination

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

Breakout Session Summaries

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

Update on APAC SWIM Implementation Materials

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

Generation and Life Cycle Management of GUFI and Related Issues

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

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

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

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

Report on SWIM in Australia

3.4.48 Australia summarised the activities and plans for the design and implementation of SWIM services in Australia. SWIM architecture and planning activities have been carried out by Airservices Australia (ASA) and the Australian Bureau of the Meteorology (BOM) over the past 18 months. A number of proposals for the APAC SWIM community were formulated.

New IWXXM design to better support SWIM

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

The Status of Shared Information Quality Management in China

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

SWIM in ASEAN Demonstration Report

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

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

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

Fourth Meeting of the Spectrum Review Working Group (SRWG/4)

3.4.54 The Fourth Meeting of the Spectrum Review Working Group (SRWG/4) was assisted by Mr. Robert Witzen in voluntary way from Montreal, who's a former ICAO Officer, expert in frequency management and main developer of Frequency Finder software tool.

3.4.55 Due to resignation of Mr. Paul Dowsett of Airservices Australia from the Chair role after the third meeting. Mr. Chainan Chaisompong, Air Traffic Engineering Manager from Aeronautical Radio of Thailand Ltd. (AEROTHAI) was elected as the new Chair of the SRWG.

Review of Regional Process

3.4.56 A secretariat paper addressed the need to explore the spectrum capacity to implement future requirements for VHF-COM systems as well as for NAV systems are in the light of determining the need to reduce in particular the channel spacing in the VHF band 108 – 117.975 MHz for ILS Localizer and VOR to 50 kHz. The paper proposed to develop a frequency assignment plan that would include all requirements for VHF-COM and for NAV systems, including GBAS/VDB, for the period up to around 2030. Therefore, the SG meeting endorsed the following Decision: **Decision CNS SG/24/6(SRWG/4/1) - Frequency requirements for VHF-COM systems and ILS, VOR, DME and GBAS/VDB facilities**.

Introduction of Signal Monitoring for ILSs Using Same Frequency But Different Identifiers at Both Ends of the Same Runway

3.4.57 China introduced the signal monitoring for ILSs which using same frequency but different identifiers at both ends of the same runway in China. In order to solve the problem of ILSs frequency strain in airports dense area, it is a common practice to assign the same frequency but different identifiers at both ends of the same runway. Such practice was implemented at Shanghai Pudong international airport and Beijing Daxing international airport. Since human factor or failure of interlock could lead navigation indication error and aircraft flight path loss, a monitoring method is necessary for protection of ILSs signal quality.

Review of Global COM List for the APAC Region

3.4.58 With the successful implementation of Frequency Finder, there was no more Frequency List No. 3 published by the ICAO Asia and Pacific Regional Office after the 29th Edition in January 2016, the up-to-date database in Frequency Finder (equivalent to Frequency List No. 3 in APAC region) is visible to all Frequency Finder users.

3.4.59 The maintenance and promulgation of Frequency List Nos. 1 and 2 are still being conducted by the Regional Office in a timely and periodic manner. It proposes to request States to update specific characteristics for NAV facilities in the Frequency List No. 2 as well as to secure that the information in the Frequency Lists is up-to-date.

3.4.60 After review of the regional Frequency List No. 3, through further discussion in the meeting, a decision was made as following Conclusion: **Conclusion CNS SG/24/7(SRWG/4/2) – Simulation of VHF COM Frequency requirements for next 10 years**.

3.4.61 Considering the important role of Frequency Finder played in the updating and maintenance of global database, relevant issues including user credential, software robustness, cyber security, etc. were addressed by the meeting. In order to fully benefit from the use of Frequency Finder for spectrum coordination, while effectively managing the relevant risks, the meeting urged ICAO to continue the robustness of the tool, endorsed the following Conclusion aimed at improving the administrative process. **Conclusion CNS SG/24/8(SRWG/4/3) – Establishment a list of focal point responsible for the operation of Frequency Finder in States**.

Review of TOR and Action List

3.4.62 The most important function of this expert working group was to study the issue of the requirement of 8.33 kHz channel spacing, and it could be considered as completed by 2016 after SRWG/3. However, with the expected changes in air traffic, it has been agreed to conduct another round of simulation on VHF COM frequency assignment in APAC Region based on operational needs submitted by States, it has also been identified in spectrum capacity to accommodate GBAS/VDB and other emerging issues in optimizing the efficient and safe use of radio spectrum. The SRWG/4 meeting discussed the aforementioned information and experiences from States, and agreed the following Decision: **Decision CNS SG/24/9 (SRWG/4/4) – Revision of the Term of Reference of the SRWG.**

Report on the results of the International Telecommunication Union (ITU) World Radiocommunication Conference (2019) (WRC-19)

3.4.63 The ITU WRC serves as the preeminent event for negotiating long-term frequency spectrum rights. This paper summarizes the discussions and results from ITU WRC-19 (held 28 October to 22 November 2019 in Sharm el Sheikh, Egypt). In general, the conference results conformed to the ICAO Position. It is now essential to form an expeditious start of the ICAO preparatory activities for the next conference in 2023, as a very large effort will be required on the part of the Organization and its Member States to ensure that the ICAO Position is supported by the conference.

Draft ICAO Position for ITU WRC-23

3.4.64 The goal of the ICAO Position is to ensure aeronautical access to appropriately protected spectrum for radiocommunication and radionavigation systems that support current and future safety-of-flight applications. In particular, it describes the safety considerations necessary to ensure adequate protection against harmful interference. Support of the ICAO Position by ITU Member States is required to ensure that the position is supported at the WRC-23 and that aviation requirements are met.

Space-based VHF Communications in 117.975-137 MHz Frequency Band

3.4.65 Singapore presented updates on the preliminary technical study findings of study of space-based VHF concept and the progress of space-based VHF discussions at ICAO and ITU meetings.

3.4.66 The SG meeting considered further work needs to be done and agreed to recommend States/Administrations who are interested and capable to join the relevant study, and as present ICAO Position for WRC-23 already included space-based VHF agenda. The Secretariat was requested to coordinate with SRWG chair and ACSICG chair to clarify how to track and monitor this initiative, and form an ad hoc group, if necessary, to take the concerns from States on a regional level so as to make the study meaningful, and the outcome of this deliberation will be reported back to CNS SG/25 meeting for consideration.

Seventh Meeting of Performance Based Navigation Implementation Coordination Group (PBNICG/7)

PBN Implementation Update

3.4.67 The Secretariat presented global PBN implementation status at international airports. and informed that regarding key requirement of ICAO Assembly Resolution A37-11, which is the implementation of approach procedures with vertical guidance (APV) for all instrument runway ends by 2016, implementation of APV procedures were behind global achievement. However, implementation of PBN SID/STAR were above the global implementation status (see **Table 1**).

Table 1. ICAO Assembly Resolution A37-11 Implementation Status

Dec 2019	PBN Approach	APV		PBN SID	PBN STAR
		LNAV/VNAV	LPV		
Global (%)	74.8	56.5	34.1	47.8	43.9
Asia/Pacific (%)	62.6	43.5	0	70	67.8

Regional Transition Plan for RNP Chart Identification

3.4.68 The Secretariat informed the PBNICG/7 meeting that Asia/Pacific Regional Transition Plan for RNP APCH Chart Identification from RNAV to RNP as accepted by states in PBNICG/6 and endorsed by ATMSG/7 and CNS SG/23 was adopted by the APANPIRG/30. Proposed contingency measure for the Regional Transition Plan for RNP APCH Chart identification as discussed in APANPIRG/30 was also presented.

States' PBN Implementation Progress

3.4.69 China provided updated information on PBN implementation. China informed the meeting that 500 out of 532 instrument runway ends of 246 airports have PBN approach procedures. The meeting was also informed that China implemented 753 PBN routes. By now, Beijing/Capital, Beijing/Daxing, Shanghai/Pudong, Shanghai/Hongqiao and other major airports have implemented RNP APCH procedures. China has also implemented 33 RNP AR procedures including 11 at International airports and 22 at Domestic airports.

3.4.70 India provided information on ATS routes, SIDs/STARs and RNP APCH implementation in accordance with its PBN implementation plan. India has implemented RNP APCH procedures for 52 Runway ends so far. Out of these 23 RNP APCH are for international airports and 29 RNP APCH for domestic airports. As per the regional transition plan for chart identification from RNAV to RNP, India has completed and changed all the chart identification and all new charts are having Chart title RNP.

3.4.71 India also informed the meeting on the progress & update on the development of SBAS (GAGAN) LPV procedures and that it is exploring the possibility of implementing LPV procedures. The secretariat asked about the clarification about GAGAN Mandate, to which India stated that it is for new aircraft to be registered in India after the cut-off date. The secretariat requested India to share the mandate on GAGAN and India agreed to share the same with meeting. The secretariat also requested India to share safety assessment of LPV procedure in the next GBAS/SBAS, to which India agreed.

3.4.72 The Republic of Korea presented its PBN implementation status in approach, SID/STAR and ATS routes. The meeting was informed that the entire RNAV5 routes operated within the Incheon FIR were converted to the RNAV2. The meeting was informed that of 18 airports (civil / joint civil and military) in ROK, LVAV / VNAV approach procedures have been established at 29 out of 56 runway ends, while LNAV procedure has been established at 34 runway ends. The ROK has completed converting naming of 32 charts from RNAV (GNSS) RWY XX to RNP RWY XX as of 15 August 2019.

3.4.73 Maldives has published 22 RNP APCH procedures, 16 LNAV and 6 LANV/VNAV. Eight more procedures will be published for the newly developed domestic airports. The meeting was informed that the process to change the identification of PBN instrument flight procedure approach charts from RNAV to RNP was completed in May 2019.Maldives has published 10 domestic routes based on the RNP 1 navigation specification, to connect the airports in the South. The secretariat raised the rationale for selecting RNP 1, which is designed for terminal airspace, Nav Specs for these routes and Maldives should consider replacing RNP 1, with RNAV 2 or RNP 2 routes. Maldives stated that due to lateral spacing requirement, they have implemented this.

3.4.74 Myanmar provided information on the PBN implementation progress in Terminal, Approach and En-route in accordance with their PBN implementation plan. However, the implementation process has been delayed due to some constraints involving military airspaces. Vietnam enquired about frequency of validation flight of Baro-VNAV procedures, Myanmar responded that it is done before publication of the procedure. The secretariat clarified that the validation process as defined in ICAO Doc 9906 should be followed.

3.4.75 Nepal provided information on the latest progress of PBN implementation in Terminal, Approach and En-route in accordance with their PBN implementation plan. The meeting was informed that Feasibility study for RNP APCH (SBAS) will be done and regional cooperation will be sought for the planned implementation if such procedures are desirable. RNP AR Departures will be designed and implemented at TIA Kathmandu. The meeting was informed that the process to change the identification of PBN instrument flight procedure approach charts from RNAV to RNP was completed in March 2020.

3.4.76 Pakistan enquired about RNP AR departure criteria, to which Nepal responded that its being designed using criteria used by industry and some States. The secretariat clarified that presently there is no published criteria of RNP AR departure in ICAO documents.

3.4.77 Thailand provided PBN implementation status in approach, SIDs and STARs, and ATS route implementation. In addition, the meeting was informed the progress of RNP AR APCH procedure, the plan for GBAS installation at Phuket International Airport as 2024 and for Suvarnabhumi International Airport postponed. For En-route operations, new RNAV2 routes (L880, M633, N506, P629) between Bangkok and Phnom Penh FIR have been developed and became operational in October. In line with the Asia Pacific Seamless ANS Plan, RNAV2 specification is planned for all new ATS Routes, international and domestic.

3.4.78 Viet Nam provided the status information on RNP APCH, SIDs and STARs and ATS route development in accordance with their PBN implementation plan. The meeting was informed about the lesson learnt, such as Airlines not being approved for RNP APCH and coordination required with Military. The secretariat suggested that Flexible use of Airspace(FUA)could provide a solution

to some of the issues related to Military coordination. In this regard ICAO Circular on Civil Military Cooperation in ATM, ICAO Circular 330 could be looked into.

CDO/CCO Implementation

3.4.79 China shared with the PBNICG/7 meeting implementation process for CDO/CCO, its benefits, and implementation status so far and planned implementation of CDO/CCO in China. It explained in detail about the technical research, Implementation Steps and Implementation results. It further elaborated that the guidance was derived from GANP, APAC Seamless ANS Plan, CDO, CCO and PBN Manual to design the implementation strategy. It also described the benefits from CDO/CCO such as Safety Improvement, Green Environment, reduction in Cockpit workload, improvement in comfort for the passengers. So far CDO/CCO have been implemented at six international airports including Guangzhou Baiyun Intl. airport and Kunming Changshui Intl. airport and etc. CDO/CCO will be implemented in more airports in China in phases.

3.4.80 India discussed with the meeting implementation process for CDO/CCO implementation at Delhi, its benefits, and challenges in terms of Traffic Pattern, Airspace Constraint, Pilot sensitization, ATC training etc. It shared some of the pictures from the actual CDO/CCO conducted at Delhi Airports and explained in detail how it is being done at one of the busiest airport with several airspace constraints.

3.4.81 The Secretariat presented the list of action items agreed by the previous meetings. The PBNICG/7 meeting was informed of the progress of 7 action items and agreed to close 6 items after deliberations. Pakistan pointed out that there is in-consistency between the number of instrument runways available in Asia/Pac e-ANP Volume II and data used by i-STARs for some States. After deliberations it was decided to add a new action item that "number of International Instrument Runway Ends to be included in iSTARS should be based on the latest information".

Report of the First and the Second Meeting of Asia/Pacific GBAS/SBAS Implementation Task Force (GBAS/SBAS ITF/1 and ITF/2)

3.4.82 As per CNS SG/23 meeting Decision CNS SG/23/9 regarding establishment of the APAC GBAS/SBAS Implementation Task Force, the first Meeting (GBAS SBAS ITF/1) was held through VTC on 23-24 June 2020 in which 104 participants joined. The TOR of the Task Force as provided in Appendix J to the CNS SG/23 meeting report was discussed. Outcomes of the ICAO GBAS/SBAS Implementation Workshop in Seoul on 3-5 June 2019 were discussed in the GBAS/SBAS ITF/1. To better capture the issues and challenges faced in GBAS/SBAS implementations, an exercise was conducted amongst participants in GBAS/SBAS ITF/1.

3.4.83 To develop awareness among participants, as well as collecting needs from States for guidance or training, the Secretariat created an exercise to capture issues and challenges regarding GBAS/SBAS implementations in the States.

3.4.84 With reference to information captured in the exercise and explanations provided by the four rapporteurs, the Secretariat proposed to structure the wrap-up in the following way:

a. Training of the operational people Stakeholders (syllabus or training package)
b. Knowledge/ Experience sharing / platform in respect of systems and procedures
c. Review of the outcomes published by ICAO Ionospheric Study Task Force in 2016
d. Organize a workshop for airspace users / CONOPS / Fleet readiness
e. ATC Interface / NOTAM
f. Guidance Material on implementation / safety assessment
g. Involvement of regulators in the overall implementation process

3.4.85 The second Meeting of the ICAO APAC GBAS/SBAS Implementation Task Force (GBAS/SBAS ITF/2) was held through VTC on 9-10 September 2020 with attendance of 118 participants. Ten IPs prepared by States and industry were presented on GBAS/SBAS activities in the region.

3.4.86 The Secretariat received two nominations for chairperson of the Task Force: Mr. Susumu Saito from Japan and Mr. Wong, Tak Yuen George from Hong Kong China. After discussion within the Task Force, both nominated candidates were elected as Co-Chairs.

3.4.87 Australia presented the status of two currently functional GBAS Landing Systems at Sydney and Melbourne airports. There are more than 3000 GLS approaches conducted per fortnight at these two airports. Percentage of GLS equipped aircraft operating at Melbourne is 40% and that at Sydney is 29%. Australia and New Zealand have established a joint project to deliver a Satellite Based Augmentation System (SBAS) capability.

3.4.88 China presented that the Beidou (BDS) was one of the 4 core satellite constellations defined in Annex 10 and the validation of BDS was being discussed and promoted. BDS-3 constellation includes 24 MEOs, 3 IGSOs and 3 GEO3. The BDS will provide the worldwide service in 2020. The BD SBAS constellation and ground system will be completed in end 2020. The accuracy of BDSBAS SF Service satisfies the requirement of APV-I.

3.4.89 Hong Kong China shared their strategy and experience in conducting a GBAS trial at the Hong Kong International Airport (HKIA), which aimed to assess the feasibility for GBAS implementation there and to identify potential impacts arising from local ionospheric effects as well as constraints induced by terrains/building structures around the HKIA.

3.4.90 The issue in VDB frequency assignment for GBAS was also raised by Hong Kong China due to the VDB frequency using the same radio frequency band as other types of ground-based navigational systems, such as VHF Omni-directional Range (VOR) and Instrument Landing System (ILS), but with large (around 1MHz) channel space required from existing DVOR/ILS frequencies already in use. Hong Kong China drew States' attention to the need for the coordination with other State/Administration for the use of navigational facilities frequency, through collaboration with SRWG and assistance from ICAO APAC Office, for the implementation of GBAS.

3.4.91 Japan presented that MSAS (Michibiki Satellite-based Augmentation Service) SBAS has completed satellites transition from MTSAT to QZSS in end March 2020. Various developments are being conducted to enhance the MSAS system, including MSAS LPV service expected to commence in 2023. JCAB updated the status of the CAT-I GBAS at Tokyo Haneda airport, for which a trial had been conducted since July 2020 to aim for formal operation commencement by the end of 1Q 2021. In addition, ENRI is conducting activities on GAST-D and GAST-E/F.

3.4.92 The Korea Augmentation Satellite System (KASS) will be completed by 2023 for the provision of the Safety of Life (SoL) service across the designated coverage. Republic of Korea pointed out the difficulty to find Geo payload to rent for transmission of the SBAS signal.

3.4.93 IATA presented that GBAS infrastructure and GLS procedures should be implemented as appropriate based on a positive business case and consultation with airlines. Regarding SBAS, due to issues associated with overlapping satellite footprints States should not support the use of SBAS to fly LNAV or LNAV/VNAV minima and should publish LPV minima for all approach procedures to be flown using SBAS. Additionally, all procedures with SBAS LPV minima should also include ABAS Baro-VNAV LNAV/VNAV minima.

3.4.94 Activities of ICAO Navigation Systems Panel (NSP) GBAS working group (GWG) Ionosphere Gradient Mitigation (IGM) ad hoc group were introduced. It is working on enhancing GBAS performance in the low latitude region that shares the common interest with this task force related to the review of APAC GBAS guidance on the ionosphere threat mitigation.

3.4.95 The United States provided an overview of their research, design approval, commissioning, and oversight of GBAS, with highlights on benefits and technical differences between GBAS and ILS. US deployment plan for GBAS meeting GAST C standards was also presented. Discussion also highlighted the need to develop and apply a site specific ionospheric threat model for assessing risk to GBAS performance.

3.4.96 The Action List of the task force proposed by the Secretariat was discussed. Description, relevance and priority of those action items were assessed by the GBAS/SBAS meeting. Action owners were assigned with target date agreed in GBAS/SBAS ITF/2.

Outcome of the Seminar on Flight Inspection and Procedure Validation

3.4.97 The Seminar on Flight Inspection and Procedure Validation (FIPV) was held in the ICAO APAC Regional Office, Bangkok, Thailand from 24 to 27 September 2019. It was conducted in accordance with the Special Implementation Project of ICAO for 2019. The seminar noted the development of FIPV technology, computer simulation analysis techniques which have been used in the prediction and analysis of navigation signals that can be further used to analyse the accuracy of the signals when a new navigation station is commissioned, or an existing navigation station environment changes.

3.4.98 Further guidance from ICAO is expected on the use of UAS (RPAS) as a viable/supplementary solution to carry out the flight inspection including cost/effectiveness analysis for introducing this emerging technology.

3.4.99 Member States/Administrations in a position to do so are encouraged to continue conducting more research and trials using emerging technologies and best practices and provide regular reports to CNS SG of APANPIRG:

a) Assessment of UAS (RPAS) for Flight Inspection/Validation including the scenarios, advantages, limitations (such as FI range, UAV speed and payload, C3 etc.) and proposed processes and procedures for implementation;

b) Improved flight inspection efficiencies and operational risks of flight inspection at night;

c) Sharing PBN flight procedure validation methods and technologies, which can save cost, improve efficiencies, and facilitate PBN implementation; and

d) PBN vulnerability to GNSS Interference, and the need for spectral assessment.

3.4.100 States/Administrations capable to do so are encouraged to further study the application of computer simulation technology and ground testing technology before flight inspection of navaids in order to facilitate the set up and best performance state of the navaids in order to improve the efficiency of flight inspection.

Flight Inspection Guidance Material (FIGM) for APAC Region

3.4.101 In response to a recommendation from the “Seminar on Flight Inspection and Procedure Validation (FIPV)”, it is decided to complement existing SARPs to provide guidance on flight inspection and to serve as a reference for States/Administrations to develop their own specific practices and procedures. It includes recommendations of key activities and milestones in planning, execution, and delivery of a flight inspection. Useful materials, including sample flight inspection reports are also included for reference.

3.4.102 There are four chapters in FIGM named Introduction, planning for flight inspection, conducting flight inspection, and reporting of flight inspection results. The FIGM introduces example flight inspection procedures for Instrument Landing System (ILS) including visual aids, Doppler Very High Frequency Omni-Directional Range (DVOR), Distance Measuring Equipment (DME), Primary Surveillance Radar and Secondary Surveillance Radar (PSR/SSR) and discusses about the

arrangement for flight inspection at night and the emergency flight inspection. Reference was also made to the reference on the considerations of radio navigation aids flight inspection periodicity during COVID-19. Reference is also given on the example flight inspection system performance specifications and associated Test Accuracy Ratios (TAR) and the workflow on reporting of flight inspection results. With aforementioned and further discussion on the material, the SG meeting formulated and adopted the following Conclusion: **Conclusion CNS SG/24/10 – Flight Inspection Guidance Material (FIGM) for APAC Region.** The FIGM is provided in the **Appendix D** to the Report on Agenda Item 3.4.

RPAS-Based Flight Inspection Program Progress in China

3.4.103 China presented progress of RPAS based flight inspection status for the year 2020 along with previous trails and their outcomes. China completed first trial of RPAS based flight inspection technology in June 2019, which validated the feasibility and suitability both technically and operationally. Based on the result, hybrid VTOL fixed wing RPAS is the best selection. China described the technical aspects of their selection. China performed 10 more trials till October 2020 to evaluate the flight inspection capability: ILS, VOR/DME, NDB, ADS-B and preliminary GBAS testing in commercial airports as well as general aviation airports. They concluded that the RPAS-based flight inspection payload developed by the joint team in China can support most of the navaids inspection in civil airport.

3.4.104 It was also discussed that the ability of the RPAS can limit actual inspection function, for example polarization was not evaluated during trials since the unmanned aircraft cannot incline to desired degree in flight for safety consideration. It was told that no COTS RPAS fulfill flight inspection requirements and listed additional features of special RPAS to be developed. China has published the first technical Specification for the RPAS-based Flight Inspection System as CAAC Information Bulletin (IB-TM-2020-005) in September 2020. China will work further on to improve RPAS technology, performance, and standards establishments with taking into considerations of different ICAO Docs requirements.

Navigational Aids Check by Using Drone in Republic of Korea

3.4.105 Korea Airports Corporation developed an ultra-compact and lightweight receiver that can be mounted in drone for check of Navigational Aids. The Korea Airports Corporation's Drone System for Navigational Aids check (DIVA) can accurately check the airborne radio signal of Navigational Aids such as ILS, VOR, and TACAN just in about 20-minutes flight. PAPI and ALS checks are under development. Compared to aircraft, drone is easy to control flight speed and can fly freely. It is possible to continuously check change in radio signal at specific point. Korea Airports Corporation built up Drone systems in each six divided regions nationwide. Guidelines on the operation procedure and safety management of drone around the airport and SOP for Drone System are prepared.

3.4.106 New infrastructure near airport can cause distortion of radio signals of Navigational Aids. The origin of radio wave obstacles can be identified by surveying the air wave environment using a drone. Thus, Republic of Korea is using drones for Non-disruptive operation of Navigational Aids. Republic of Korea has completed European CE certification for the receiver of Navigational Aids for drone. In addition, Republic of Korea is conducting technical consulting for drone check in Brazil and Colombia.

Protection of ILS Critical and Sensitive Areas in Three-Dimensional and ILS Facility Performance Category Requirements

3.4.107 Hong Kong, China shared their observations on a common scenario of potential impacts of departing aircraft on arriving aircraft under runway mixed-mode operation in many airports. Hong Kong International Airport encountered cases on Localizer (LOC) signal fluctuations occurred during single runway mixed-mode operation, the pilots of arriving aircraft reported LOC

signal fluctuations at the time when departing aircraft on the same runway flew over the LOC antenna, and the ILS CA/SA on ground was found clear without any intrusion. ICAO Annex 10 Volume I, Attachment C, highlighting the need for States to extend protection of the ILS Critical and Sensitive Areas (CA/SA) from two-dimensional (2D) context to volumes. Currently, Annex 10 Vol. I Attachment C concerning guidance in protection of ILS CA/SA focuses on protection in 2D instead of three-dimensional (3D).

3.4.108 According to ICAO Annex 10 Vol. I, Amendment 92 applicable on 5 November 2020, in order to utilize the Facility Performance Category II and III, the level of integrity and continuity of service of the new ILS in accordance with the ILS classification system shall be at least level 3. For meeting the level 3 requirements, at least 3,200 hours of the new ILS operations would be needed. However, taking into consideration the need to assess the seasonal influence of the environment, one year is typically required for new ILS installations. This period may be reduced in case the operating environment is well controlled and there are other similar proven installations. However, no further details are elaborated in Annex 10 as to how to reduce the evaluation period. More guidance on how to reduce the evaluation period was requested.

3.4.109 Hong Kong China invited States to note the importance of protecting the ILS CA/SA in volumes and the minimum evaluation period for specific ILS facility performance category. ICAO was requested to provide more guidance for ANSPs to protect CA/SA in volumes and to achieve the required facility performance category for new ILS installations within the shortest evaluation period. In view of significance of this subject with impacts on flight safety, the SG meeting adopted the following Conclusion: **Conclusion CNS SG/24/11- Protection of ILS Critical and Sensitive Areas in Three Dimensional.**

BDS SARPs Development and Validation Status in ICAO

3.4.110 China presented the status of BDS Open Service SARPs development and validation work in ICAO, which is at the final stage of completion in ICAO NSP.GNSS SARPs except the generic sections for all the four cores constellations including BDS have been fully validated and translated into various ICAO languages. After NSP JWGs/6 meeting in June 2020, the open requirements of BDS in GNSS generic sections pending for validation are the Radio Frequency Interference related ones. ICAO NSP/6 meeting held from November 2nd November to 13th November. China presented BDS RFI related working paper WP 25. All the open requirements on RFI for BDS in GNSS SARPs generic sections were closed. This is an important milestone for BDS standardization work in ICAO and a good start and guidance for future BDS MOPS development. The next step for BDS SARPs review in ICAO is supposed to be the submission from NSP to ANC to review and the state letter process.

BDSBAS Status Update Report

3.4.111 The BeiDou Navigation Satellite System (BDS) was formally commissioned on July 31st, 2020. BDSBAS will provide Single-Frequency (SF) and Dual-Frequency Multi-Constellation (DFMC) services, in accordance with the ICAO standards, in China and surrounding areas and achieve APV-I and CAT-I precision approach capabilities. BDSBAS is comprised of space segment, ground segment and user segment. The BDSBAS space segment includes successfully launched 3 Geostationary Earth Orbit (GEO) satellites at 80°E, 110.5°E and 140°Ewith PRN codes 130,143, and 144. The BDSBAS ground segment consists of 30 Monitoring Stations (MS), 2 Data Processing Centers (DPC), 1 Operation Control Center (OCC) and 3 Uplink Stations (US). The BDSBAS user segment refers to the SBAS terminals used in civil aviation, maritime and railway applications etc.

3.4.112 China explained the technical characteristics of three GEO satellites and informed that the ICD of BDSBAS B1C has been published by China Satellite Navigation Office in July 2020 and is available on BDS website. The paper also presented TEST RESULTS OF BDSBAS SF SERVICE. As per the results, both horizontal and vertical safety indexes are larger than 1, which means no appearance of the integrity risk during the test periods. It was estimated that BDSBAS SF

service will broadcast SF test signals based on ICAO SARPs and BDSBAS B1C ICD by the end of 2020 and the certification process having three parts i.e. technical review, system test and initial operation. BDSBAS SF certification scheme will be carried out accordingly, and last for at least 3 years.

Status of GBAS Implementation in Japan

3.4.113 Japan have been working on implementing CAT-I GBAS in Japan including development of specifications, certification framework, ionospheric threat model, and other operation related frameworks. Japan has also been working on a CAT-I GBAS prototype, APAC common GBAS ionospheric threat model, validation of GAST-D standards, and evaluation of DFMC GBAS concepts. Japan discussed about first CAT-I GBAS implementation manufactured by NEC Corporation and currently in trial phase at Tokyo Haneda. Its ionospheric threat model is based on the APAC common GBAS ionospheric threat model with some modification based on the observation and analysis by ENRI. It has two ionosphere field monitor (IFM) stations and four reference stations. CAT-1 GBAS approach procedures have been published as AIP supplement.

3.4.114 A GAST-D ground experimental prototype and an airborne experimental subsystem have been developed by ENRI and its results contributed to the standardization of GAST-D. Japan continues to support refining the GAST-D standards in the ICAO NSP. Additionally, DFMC GBAS study is being conducted by ENRI for evaluating concepts of DFMC GBAS. Japan will contribute to ICAO activities on DFMC GBAS standardization. Japan is actively contributing to the APAC GBAS/SBAS ITF and would welcome the first face-to-face meeting.

GBAS VDB Frequency Compatibility for Tokyo Haneda

3.4.115 The ICAO standards on the frequency compatibility between VHF radio navigation aids have been defined. Japan presented GBAS VDB frequency compatibility analysis with other VHF radio navigation aids near Tokyo Haneda is called “airport-to-airport compatibility” while compatibility with other systems in the same airport considering the geometry of the VHF facilities and runways is called “same-airport compatibility”.

SBAS Status Update in Japan

3.4.116 Japan’s SBAS MSAS has started operation with MTSAT in Japan’s FIR on 27 September 2007. A decision of MSAS LPV implementation was made on 13 March 2018. MSAS LPV using three GEOs (QZS3, 6 and7) is expected to be operational in 2023.MTSAT-2 was broadcasting two PRN codes (129 and 137). During MSAS transition from MTSAT to QZS-3 (GEO) at the end of March 2020, PRN129 and PRN137 were transferred from MTSAT to QZS (GEO) satellites. QZSS seven satellites configuration is expected in 2023 with three GEOs broadcasting L1 SBAS signal. Additional PRN is necessary for three GEOs configuration in 2023 to perform a successful transition from the NPA service to the LPV service.

3.4.117 Using MSAS V2 by only QZS-3, MSAS LPV250 approach will be introduced step by step from 2021 as MSAS LPV250 trial operation in advance of MSAS LPV full-scale operation. This trial operation will be expected to boost the proficiency of Airline pilots maneuver and the motivation for introducing SBAS LPV receiver in Airline. Japan will start LPV operation at all airports to designed IFR approach, excluding 2 military control airports. L5 augmentation signals with PRN196 (QZS2: IGSO) for DFMC SBAS validation became available on 23 September 2017. In addition to the L1 SBAS signal, all QZSS satellites but QZS-1 have the capability of broadcasting DFMC SBAS messages through the L5S signal. Additional L5 augmentation signals are available with PRN197 and PRN200. PRN assignment for non-GEO SBAS satellites is still pending in DFMC SBAS SARPs development. The L1 SBAS ranging will not be provided at the start of the service with the QZSS GEO. Evaluation of ranging accuracy from the view point of GEO orbit and clock accuracy as well as the ranging signal quality may make it possible to provide the ranging function in far future. Same possibility will be evaluated for DFMC SBAS L5 signal not only for GEOs but also for IGSOs.

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

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

PNG Deployment of Space Based ADS-B

3.4.119 After a successful space-based ADS-B trial using a VPN on the internet to deliver data, PNG has contracted for space-based ADS-B to serve the whole PNG FIR plus 50 miles. Service acceptance testing will be performed by the ANSP, supported remotely by Aireon (due to COVID). It is expected to become operational later in 2020 and will operate in tandem with existing ADS-B and radar services. The system will initially use dual MPLS lines to USA to receive the service, but PNG has joined CRV and expects to transition to a dual CRV solution in 2021. The CRV solution will use two Package C nodes, supported by 1 MPLS and one VSAT terminal. A CRV contract has been signed with PCCWG to provide the CRV connections supporting AFTN/AMHS, Voice, AIDC, ADS-B ground station sharing and space-based ADS-B. Aireon was approved to connect to the CRV earlier in 2020 and can now deliver pace-based ADS-B to other CRV customers potentially without additional communication links. PNG also anticipates sharing ADS-B ground station data with Australia and Indonesia via CRV.

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

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

Long-range Air Traffic Surveillance Display System for ATFM

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

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

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

The ICAO Aircraft Address Monitoring in Japan

3.4.123 As an agreed action item by SURICG/4, Japan presented to the meeting on its experience on the ICAO Aircraft Address (Mode-S address) monitoring since 2007, which including monitoring activity, tool function, monitoring results and reporting paths. JCAB already took 6 correcting actions for Japanese civil aircraft and JSDF (Japan Self Defense Force) aircrafts in recent 4 years. The SURICG/5 meeting thanked Japan for this sharing, and agreed to incorporate the main content of this paper into the AIGD.

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

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

Implementation of New Surveillance System within Pyongyang FIR

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

Standards to Support Global Interoperability

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

3.4.127 The SURICG/5 meeting expressed its appreciation and gratitude to EUROCAE, encouraged States to nominate members to attend various technical WG meetings. EUROCAE suggested to focus on challenges and priorities to effectively balance the needs in different regional environments in making standards. As it is globally and publically open, EUROCAE encouraged SURICG members to make use of the online resources by subscribing the email service from EUROCAE webpage at www.eurocae.net to enhance the engagement with EUROCAE, and benefit from this open consultation process in the standards development, to gain visibility and have the possibility to provide comments on draft standards. The SURICG/5 meeting highly recognized the value to explore more on better collaboration with EUROCAE during various meetings in APAC Region.

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

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

3.4.129 The SG meeting reviewed and further updated the ADS-B implementation information consolidated by SEA/BOB ADS-B WG/15 and SURICG/5, and the Table of ADS-B Implementation Status in the APAC Region is provided in **Appendix M** to CNS SG/24 Report. Currently 30 States/Administrations installed ADS-B ground stations, 12 States issued ADS-B mandate and 8 States used ADS-B for separation and others for awareness, gap filling and redundancy.

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

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

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

3.4.131 Hong Kong China updated the SEA/BOB ADS-B WG/15 meeting on the latest status of ADS-B Avionic Problem Reporting Database (APRD) after its deployment in ICAO APAC web site in 2017. The APRD could contain useful information of generic ADS-B avionics performance problem commonly encountered in the Region as well as specific avionics issues that States/Administrations need to pay attention during the ADS-B Implementation. However, the usage of APRD by States/Administrations appears to be low since its deployment. States/Administrations were encouraged to make best use of the database to improve the quality of avionics equipage in ADS-B mandated airspace, report and share avionics issues. APRD direct link: https://applications.icao.int/ADSB-APRD/login.aspx

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

3.4.132 The meeting appreciated a brief demonstration during SEA/BOB ADS-B WG/15 presented by Singapore on the ADS-B data derived from space-based ADS-B and the audio recording of HF, VHF and DCPC type of SATVOICE conversations between ATC controllers and pilots for voice quality comparison. An in-house developed processing server can filter the ADS-B data for the specified airspace for display or for onwards transmission to another user.

Achievement and future of SEA/BOB ADS-B WG

3.4.133 The SEA/BOB ADS-B WG/15 meeting reviewed and discussed the paper jointly presented by Singapore, CANSO and the Secretariat. The meeting recalled that the SEA ADS-B WG was established by APANPIRG in 2007 through APANPIRG conclusion 18/38. In 2011, SEA ADS-B WG was renamed as SEA/BOB ADS WG.

3.4.134 The SURICG/5 meeting discussed next step and the possible future work for the ADS-B WG including a number of new tasks identified in the proposed amendment to TOR. The meeting also discussed whether the SEA/BOB ADS-B WG should be closed and a new working group – regional ADS-B working group be established to deal with identified new subject/works. The meeting further considered an option to merge the work of the working group into work programme of SURICG. Finally, based on the outcomes of a vote, the meeting agreed to formulate a draft Decision on the dissolution of SEA/BOB ADS-B Working Group for CNS SG/24 consideration. With aforementioned, the SG meeting adopted the following Decision: **Decision CNS SG/24/12 (SURICG/5/2) - Dissolution of SEA/BOB ADS-B WG.**

Report of DAPs WG/3

Utilization of Mode-S DAPs Data for Weather Forecast

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

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

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

not provide the reader with clear guidance whether interrogators installed with MLAT and ADS-B may use II Code = 0.

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

II/SI Operations

3.4.138 Although ICAO mandated that all aircraft transponders have to be SI capable for radars to use SI codes by 1 January 2003, but not all are SI capable. Non SI capable transponders will only be able to recognize the last 4 bits, hence will mistakenly lock out to other radars with different SI codes, but with the same last 4 bits. To work around the situation, parts of Europe employed a special mode of operation known as the II/SI Operation. Under this operations, the radar will only lock-out aircraft with SI capable transponder but will not lock out non-SI capable transponder.

Mode S Mandates

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

3.4.140 Therefore, a Conclusion is adopted as following:

<table>
<tr><td colspan="3">Conclusion APANPIRG/31/14 (CNS SG/24/13 (SURICG/5/3(DAPS WG3/1))) - Mode S Forward Fit Equipage in APAC Region</td></tr>
<tr><td colspan="2">What: Regarding fitment of Mode S equipage,

That, States/Administrations in APAC Region be strongly encouraged to mandate that registered aircraft with a maximum certified take-off mass exceeding 5 700 kg or having a maximum cruising true airspeed capability greater than 250 knots, with a date of manufacture on or after 1 January 2022 be equipped with Mode S avionics compliant with Enhanced Surveillance (EHS).</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Considering that a number of DAPs applications will require EHS and that it’s easy for new aircraft to be equipped with EHS. Retrofitting existing airframes with EHS will need further deliberation under challenging pandemic situation.</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☒APANPIRG ☐ICAO HQ ☒Other: SURICG</td></tr>
</table>

Use of SI Codes

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

Radar Clustering

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

Use of Conspicuity Code

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

Weather Reporting Capability

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

Datalink Map

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

SSR Reception Malfunction Caused by UAV Video Transmitter

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

Collaboration in Sharing of Surveillance Data in SWIM

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

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

particularly ADS-B data as SWIM services carried over CRV and support the establishment of the Study Group to recommend solutions on regional surveillance data sharing to provide surveillance from "departure to destination".

3.4.149 The SG meeting noted the Draft Decision SURICG/5/1 as well as the relevant outcome from SWIM TF/4, and an ad hoc group led by Hong Kong China had prepared a draft TOR for the proposed Study Group for further consideration by CNS SG. After deliberation, the SG meeting discussed the draft TOR through **Flimsy/06**, and deferred to the Study Group to fine-tune its TOR and decided its time schedule and deliverables for updating to SURICG. It was agreed that SURICG will be held after SWIM TF, so that the progress made by the Study Group would be shared with SWIM TF before reporting to SURICG. The SG meeting adopted the following Decision: **Decision CNS SG/24/16 (SURICG/5/1) - Establishment of Study Group under SURICG on Sharing of Surveillance Data in SWIM.**

Air Traffic Control Surveillance Activities in India

3.4.150 India is continuously upgrading and augmenting the current surveillance capabilities. Indian airspace is covered by redundant surveillance coverage including 16 nos. of ASR/MSSR, 02 nos. of ARSR/MSSR, 12 independent MSSR, 04 ADS-C/CPDLC links, 21 ADS-B Ground receivers, and 11 Nos. of ASMGCS. India has entered a service contract with service provider of space-based ADS-B for Chennai and Mumbai. India has entered into agreement or planning to share ADS-B data with neighboring countries such as Myanmar, Malaysia, and Indonesia. 36 Nos of ADS B ground receivers have been planned. These will enhance redundancy for surveillance in existing Radar airspace and extend surveillance coverage to low density airports and certain oceanic airspace including facilitate extension of surveillance coverage for low altitude. The DGCA of India has issued ADS-B Avionic mandate from 01.01.2020 onwards. All aircrafts flying over Indian continental airspace at or above FL-290, are to be equipped with on-board ADS-B equipment. Also, contemplating to provide priority in landing to the aircrafts equipped with ADS-B at airports where ADS-B based approach surveillance services are being provided is going on.

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

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

Lockout Override Operation to Avoid IC(II) Code Collision

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

Outcome of Seminar on Air Traffic Management Automation System and First Meeting of Air Traffic Management Automation System Task Force (ATMAS TF/1)

3.4.153 The Seminar on Air Traffic Management Automation System and the First Meeting of the Asia/Pacific Air Traffic Management Automation System Task Force (ATMAS TF/1) were held from 27 to 30 October 2020. The seminar was conducted in two sessions, the Session 1 focused on Experience Sharing from CAA/ANSPs, while the session 2 focused on New Technology and Approach from Industry, it provided a platform for participants to exchange experience and keep abreast of the latest knowledge on the subject of air traffic management automation.

3.4.154 Ms. Xie Yu Lan, Deputy Director General of North China Regional Air Traffic Management Bureau of CAAC, and Mr. Kwek Chin Lin, Chief ATC Specialist (Systems Development) from Civil Aviation Authority of Singapore, who were both unanimously elected as the co-chairs of the ATMAS TF.

Global and regional ATM Automation System updates

3.4.155 The ATMAS TF/1 meeting recalled AN Conf./12 recommendations: **Recommendation 1/11 – Automation roadmap.** The meeting also noted the Action Item 54/13 of 54th DGCA Conference on ATM system. The meeting noted the editorial change on air traffic automation system between the ICAO GANP (DOC 9750) edition 5 (published in 2016) and the GANP edition 6 as a portal at: **https://www4.icao.int/ganpportal/.** The meeting also noted the ICAO provisions relevant to automation.

ATM Automation System implementation in Indonesia

3.4.156 Indonesia has 14 ATM systems consisting of 12 for main system and 2 for backup system, deployed to provide ATC surveillance in 12 terminal and approach, also area control services (Jakarta ACC and Ujung Pandang ACC). Indonesia adopted an phased approach to implement ATM automation system, covering System Plan and Design (meet the requirements of the airspace structure and services), System Installation and Commissioning (with reference to the instruction contained in documentation of each system), Systems Operations Management and Maintenance Practices (with respect to the SOP, site specific changes and technical personnel ratings).There are three phases for the Operational Transition: Dry Shadow Phase, Wet Shadow Phase and Cut Over. Contingency Plan was also introduced for Transition Period, Operational period while considering various system configuration and the scope of the failure.

Challenges in Implementation of ATM Automation System

3.4.157 The implementation of ATM Automation system is a complex task in terms of Time, Money & acceptance of ATM Automation system by the user. With the successful commissioning for a new ATM Automation system at Delhi International Airport and Delhi ACC recently, India shared the challenges faced during the implementation in different phases of project, as well as suggestions to address the challenges. (refer to para 7.38)

Software Management and Technical Support in ATM Automation System

3.4.158 China has more than 90 sets of ATM Automation System and established the software management and technical support system. It covers all system construction and operation stages, including many actives, such as system requirements analysis, system fault management, software release, test and evaluation, parameter configuration management. It is essential to the safe and regular operation of the system in the whole life cycle.

Different ATM Automation System Implementation in India

3.4.159 India has installed multiple ATM automation systems of various capabilities across the Indian airports to utilize the large network of surveillance sensors. Since each of the ATM automation system was installed in different stages, the Air Navigation Service Provider (ANSP), Airports authority of India (AAI) operates a combination of Automation systems from various vendors having different capabilities and with varied experiences. India shared the common features and differences between various Automation System architecture installed.

Application of Flight Data Exchange in ATM Automation System

3.4.160 In order to adapt to the rapid development of civil aviation in China and improve the safety assurance level of the Air Traffic Management Automation System (ATM AS), the Civil Aviation Administration of China (CAAC) issued the industry standard "Civil Aviation Air Traffic Control Automation System" (MH/T 4029). The third part: Flight Data Exchange (MH/T 4029.3), which defines the protocol, message type and data format for the flight data exchange between the ATM AS and related systems, the standard is mainly used for the ATM AS planning, design, construction, testing and operational use.

Application of Flight Plan Centralized Processing System in ATM Automation System

3.4.161 Flight plan centralized processing system (FCPS) is a set of intelligent control system independently developed by ATMB, which is responsible for processing National flight plans and telegrams. It was officially put into operation in September 2017. With the construction of National Flight Plan Processing Center, the unified processing of flight plans of 237 airports in China has been completed. The rudiment and new business mode of unified management of national flight plans have been preliminarily established.

Initial Application of CRACP in Flow Management System

3.4.162 CRACP (Cross-Border ATFM Collaborative Platform) can realize the data docking between China, Japan and ROK air traffic management units using their respective systems to achieve full situational awareness of cross-border flights from 2 hours before EOBT to the transfer point, and implement more accurate and more limited traffic on this basis Management measures. Thereby reducing the length of traditional interval restrictions and the number of affected flights, and improving the quality of operations.

ATFM-ACDM Integration

3.4.163 India presented a case study of the actual integration of Airport Collaborative Decision Making (ACDM) and Air Traffic Flow Management (ATFM). ATFM-ACDM integration is a process to achieve data exchange between these two systems without the need for any manual intervention.

Challenges in Implementation of DMAN

3.4.164 Singapore shared her experience in the implementation of Departure Manager (DMAN). Singapore introduced A-CDM in Oct 2016 at Singapore Changi Airport. A-CDM and DMAN are closely inter-linked and have high dependencies on one another. DMAN is a key system to support the implementation of A-CDM, and it uses the information shared through A-CDM to work effectively. DMAN requires the TOBT inputs from airlines or ground handling agents to calculate TTOT and TSAT. The importance of accurate TTOT was emphasized. The interdependencies between A-CDM and DMAN is highlighted. The success of DMAN implementation does not solely depend on the system itself. It is much more complex than Arrival Manager (AMAN) implementation, where automation alone can probably achieve the desired results. For DMAN to work, it requires a reasonable level of TOBT accuracy, and this can only be achieved if stakeholders

act in the spirit of collaboration and commit to adhering to the agreed A-CDM processes and procedures.

Implementation of Enhanced Wake Turbulence Separation and Approach Spacing Tool in Hong Kong China

3.4.165 Hong Kong, China has conducted a safety case study for the implementation of ICAO "enhanced Wake Turbulence Separation" (eWTS) at Hong Kong International Airport (HKIA). The study involved a 12-month wake study and analysis on the real-time data collection, generation and dissipation rates of wake vortices of different aircraft types in the local Hong Kong environment. The wake vortex data was analyzed by international experts, and a safety case was prepared to demonstrate with evidence that the safety assurance arguments supported the implementation of eWTS in HKIA operations, and that the wake encounter risk for each aircraft pair under eWTS would remain with the current acceptable safety risk level.

Application of AMAN Technology in Busy Terminal Area

3.4.166 Shanghai and Beijing's AMAN system adopted the integrated AMAN system, and introduced the characteristics of the integrated AMAN system and the interaction with the ATM automation system.

Application of DAPs Data in ATM Automation System

3.4.167 China has promoted the application of Mode S radar in ATM automation system in three stages. In the first stage, Mode S elementary surveillance data has been applied in ATM automation system. DAPs data with specific application scenarios are currently underway in the second stage, and the rest will be further studied in the third stage. At present, China is in the second stage and this paper concludes the specific application, benefits and problems of DAPs data in ATM automation system.

Application of DAPs in ATM Automation System in Singapore

3.4.168 Singapore shared their experience in the introduction of DAP. The ATM automation system in Singapore was upgraded in 2018 to display DAPS on the aircraft label. Singapore highlighted the issues (and resolution) and challenges in the. Besides the display of information obtained from DAPs, the ATM automation system in Singapore was also enhanced to incorporate the information in its processing of existing safety nets which results in lesser false alerts.

Application of MTCD Functions in ATM Automation System

3.4.169 CAAC ATMB has deployed Medium Term Conflict Detection (MTCD) function in Beijing and Shanghai ATM Automation System. It is widely commended by controllers, mainly being ascribable to call their attention to keeping aircrafts separation in a certain time advance rather than in a closely short time, and is helpful for airspace safety especially in heavy traffic. China presented to the meeting on the concept of MTCD and the differences between MTCD and STCA, as well as the tuning experience and operational use of MTCD in ATM Automation System.

Progressive Implementation of Safety Net Functions in Hong Kong China

3.4.170 Hong Kong, China has adopted a progressive approach in the implementation of applicable safety net functions in the ATM Automation System, so as to minimize the risks involved in transition to the ATM Automation System, and to best suit the operational needs of air traffic control officers (ATCOs). Following this approach, three safety net functions, namely Short Term Conflict Alert (STCA), Special Use Airspace Intrusion Warning (SUAIW) and Cleared Level Adherence Monitoring (CLAM) have been successfully implemented since the full commissioning of the ATM Automation System in November 2016.

Cyber Security Control for ATM Automation System

3.4.171 With the implementation of data exchange between ATM automation system and other external systems, the operational environment of ATM automation system has been changed. Considering the system boundary is constantly expanding, the cyber security of ATM automation system becomes a key issue which is supposed to pay special attention on. Considering the operation of ATM automation system, it is recommended to give priority to P(protection) and D(detection)to set up technical mechanisms control for ATM automation system. it is suggested to optimize system network structure, deploy security equipment and related configuration strategies at the boundary, and improve the system capability to prevent and detect external threats. An optimized network structure of ATM AS and five measures were proposed for reference, and three suggestions were also provided as follow-up actions.

A Proactive and Systematic Approach in Protecting Digitised Air Traffic Services Against Cyber Threats in Hong Kong China

3.4.172 Hong Kong China provided information about its proactive and systematic approach in protecting digitised Air Traffic Services (ATS) against cyber threats in Hong Kong. Hong Kong, China fully supported the ICAO's initiative on aviation cyber security management against cyber threats, and had taken proactive measures in a systematic manner to address an increasing challenge on cyber security for ATS systems.

Recommended Functions and Performances of ATM Automation System

3.4.173 The development of a guidance material of implementation of ATM automation system is one of the key deliverables of ATM automation system task force (ATMAS/TF) as per the Terms of Reference. This working paper was jointly prepared by China, Hong Kong China and Singapore to explore the Recommended Functions and Performances of ATM Automation System (RFAP of ATM AS) and proposed a draft as edition 0.0 for future formulation and development by the task force, as the guidance material for systems planning, design, testing and implementation of ATM automation system in the Asia and Pacific Regions. An ad hoc group was established to facilitate the various tasks shared by group members, which include China, Hong Kong China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Philippines, Singapore, Thailand and Vietnam. The Rapporteur of this ad hoc group is Ms. Cao Su Su from China

Lessons Learned from New ATM Automation System Implementation

3.4.174 Thailand initiated the Thailand Modernization CNS/ATM System (TMCS) project to replace previously aging CNS/ATM systems along with ATM automation support system. Transition to use new system completed in Q1 2020. Thailand presented summary of lessons learned from implementation of new ATM Automation System.

China Civil Aviation Ground-Ground Communicationnetwork Status

3.4.175 China presented the information of China civil aviation ground-ground communication network (CCACN), including network scale, network topology, application technology and services accessing. The CCACN will not affect or make change communication mode with neighboring States. China joined the CRV Network in October 2020 and had already completed the implementation on 26 October 2020.The CCACN will setup interface for connecting the CRV for more selection in international communication in the future.

The Long-Term Vision for the Future Air Traffic Systems of Japan (CARATS)

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

Update of ADS-B &AIDC Implementation in Indonesia

3.4.177 Indonesia has carried out several stages of ADS-B implementation and has implemented ADS-B mandate (Tier-1) for all transport category aircraft at all level in particular airspace, since 23 April 2020. Area of ADS-B implementation are class A airspace between FL245 – FL600, class B, C, D, and E airspace between Ground to FL245, at 9 control zones and terminals. the population of ADS-B equipped aircraft increase to 87% from all transport category aircraft from 85% initially. Additionally, new ADS-B ground stations are deployed to cover the eastern part of Indonesia and the Indonesian FIR boundary. Indonesia also shared AIDC implementation status in Indonesia, especially Ujung Pandang ACC, until end of Q2-2020.

Reinforcement of CNS Capability around Fukue-Akara Corridor Area in Incheon FIR

3.4.178 For the need for coordination between States concerned in order to identify optimum solutions to address safety and efficiency issues, the Technical Working Group (TWG) was formed with technical experts designated by States Concerned. The Republic of Korea reinforced CNS system around the Corridor area in support of addressing safety and efficiency issues in the said area. It includes new Installation of U/VHF Equipment, installation of DSC between Shanghai ACC and Incheon ACC, new installation of Radar (ARSR/SSR) on highland of Mt. Halla, installation of primary and secondary surveillance radar (SSR), and ADS-B establishment and implementation.

Updates on CNS Collaboration between ICAO Regional Office and EUROCONTROL

3.4.179 EUROCONTROL presented briefly about its history, structure, and current role, in particular the European Network Manager (including traffic flow management) and as an international Air Traffic Control center. The presentation highlighted the iCNS Unit activities including Datalink Performance Monitoring- DPM, Navigation systems Monitoring Ground + GNSS- NAVM, Surveillance Interrogators, Surveillance Avionics, ACAS and Altimetry Monitoring Service- SI3AM. The presentation covered 1030MHz-1090MHz status Monitoring, Altimetry Monitoring, Spectrum and Radio Frequencies monitoring, Datalink Implementation Support, COM – IP, COM - ATS Messaging Management and their associated tools. Various tools were also introduced, such as DEMETER and AUGUR, SUR Code Allocation Tool, SUR Services Tools, and NAV PBN tools. The participants were invited to visit EUROCONTROL website to get a network-wide view of European CNS infrastructure.

3.4.180 EUROCONTROL tools were mainly developed for use at European level, however, they may be tailored to meet other national and regional needs. The SG meeting requested ICAO APAC Office to further identify the services, information and tools provided by EUROCONTROL that may benefit this region, further cooperate on specific topics with the APANPIRG contributory bodies reporting through CNS SG, and the member States were encouraged to individually contact EUROCONTROL for various services.

Review Outcomes of Small Working Group Study on Human Factor Issues of ATSEP

3.4.181 IFATSEA initiated the study with the objectives to study the human factor issues of ATSEP on their working environment, to identify the significant factors that add stress and fatigue and affect their safety job performance, to understand the stress and fatigue levels of ATSEP and for resolving potential risks to ANS, to identify the significant counter measures, and to identify the means for improving the safety culture and professional engagement.

3.4.182 The meeting appreciated the effort led by IFATSEA, and recognized the values of recommendations from the study report, and supported the further scope of work proposed by IFATSEA and then adopted the following Conclusion:

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

Cybersecurity of CNS/ATM systems

Outcome of APAC Cybersafety and Resilience Workshop with Tabletop Exercise

3.4.183 The objective of the ICAO Asia Pacific Cyber Safety and Resilience Workshop with Tabletop Exercise (APAC CSR TTX), held in November 2019, was to empower CAAs and ANSPs with measures to mitigate the exploitation of critical information systems, develop awareness on cyber issues affecting aviation, and foster a cyber-safety culture that promotes a resilient and secure cyberspace. Particular focus was placed on the development and promotion of a common understanding of cyber threats, vulnerabilities and resultant risks across the aviation ecosystem.

3.4.184 During the Tabletop Exercise with three scenarios, the facilitators provided the participants an opportunity to simulate a cyber-event affecting international, regional and domestic operations. The scenarios focused on systems, which form an integral part of flight operations. By using a predefined scenario and introducing new challenges throughout the exercise, participants became aware of what coordination efforts would be required at a management level to successfully navigate a cyber-event. Discussions on the 3 Scenarios covered a lot of topics, and various recommendations were proposed, including general recommendations on cyber safety/risk, oversight needs, training needs, organizational needs, coordination mechanisms and other needs, as well as additional TTX observations summary.

3.4.185 CANSO provided a publication to the SG meeting, *the CANSO Standard of Excellence in Cybersecurity*, which brings together best practices, knowledge and experience from various industry stakeholders to enable air navigation service providers (ANSP) to assess and improve their cybersecurity performance, as well as their suppliers. This document is available at: https://canso.org/publication/canso-standard-of-excellence-in-cybersecurity/

ICAO Trust Framework Update

3.4.186 ICAO Headquarters presented updates about the ICAO trust framework, which formally started after following AN Conf./13 Recommendation 5.4/1. ICAO presented its vision for the global trust framework, highlighting the risk of diverging efforts and the need for converging strategies for all aviation ecosystem stakeholders that build on existing foundations. The SG meeting was also informed about the *Aviation Cybersecurity Strategy* published in October 2019 and the 1st Edition of the *ICAO Cyber Security Action Plan* (CyAP) at following webpage: https://www.icao.int/cybersecurity/Pages/default.aspx

Discuss and share experience and application of new technologies

3.4.187 Under this agenda item, as the response to APANPIRG's call on enhancing engagement with industry, various industry partners were invited to share the latest development of new technologies and smart solution in relevant areas, including ANSP International Connectivity and Cybersecurity by Nokia, Application of New Technologies in ATC HMI Design by Thales, IT VCS for ATM by Frequentis and Digital Transformation - The Airport and Beyond by Searidge.

CNS Related Work/Projects Impacted by COVID-19

ANS Planning and Provision – A New Normal?

3.4.188 CANSO presented the potential impact of Covid-19 on ANSPs in the planning and provision of air navigation services. The SG meeting appreciated CANSO's sharing and reminded States to keep an eye in future while dealing with the cost-cutting due to COVID-19. The Egis report is available through the following link: https://en.calameo.com/read/0040249107c41ca06fa30?page=1

3.4.189 India presented the impact of COVID-19 pandemic on CNS related work and projects of Airports Authority of India along with discussion of various measures undertaken to limit such impact. For projects under planning stage, delay in formulation/finalization of operational & technical requirement of CNS/ATM Systems has been addressed by conducting regular Web Conference meetings and coordination through electronic means. For projects under Tender stage, time delay in Tender invitation evaluation and award of contract is mitigated by mandatory to work on e-office. For projects where Installation & Commissioning was in progress and where Manpower is required to be deployed from Overseas to complete the installation, AAI coordinated with vendors to depute their Installation team as soon as International flight operations get started while for in house projects, various ILS, DVOR/DME replacement projects have been completed. India has invoked "Force Majeure" clause to all projects and other supply contracts to avoid any financial burden on the vendors.

Impact of COVID-19 to CNS Works

3.4.190 Most of the ICAO ASIA/PAC meeting schedules of 2020 were postponed and some had to be cancelled. As the report of progress and some action requirements need effective communication and efficient cooperation between Regional Office and member States, the COVID pandemic caused a great challenge to ICAO ASIA/PAC to achieve and accomplish all work programme. During the process of various online efforts, some observations were identified:

1) Number of participants increased significantly compare to face-to-face meeting.
2) Webinars were widely recognized.
3) Time Zone impacted meeting arrangement and effectiveness.
4) Difficulty for hands-on demonstration.
5) Postponement of required update.
6) Limitations on networking and coordination.
7) Workload of the Secretariat increased.

Introduction of the Network Performance Assessment Center

3.4.191 Japan presented information about recently established (April 2020) Network Performance Assessment Center (NPAC) in Japan, which was established to monitor, analyse and assess the service level of each CNS system to assure if it meets the required performance specification for PBO (Performance Based operation).

Briefing on the Technical Cooperation Bureau

3.4.192 ICAO secretariat presented briefing about the Technical Corporation Bureau (TCB). ICAO reminds the mission of the TCB to support States in implementing international civil aviation SARPs and policies. TCB discussed various on-going projects by the types in APAC in the year 2020 and benefits of regional projects for CNS/ATM.

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AERONAUTICAL MOBILE SERVICE (AMS) STRATEGY FOR THE ASIA/PAC REGION

The AMS strategy for the Asia/Pac Region is to:

a) Ensure that all communications are provided within the Aeronautical Mobile (R) Service AM(R)S and the Aeronautical Mobile Satellite (R) Service -AMS(R)S, and protect the use of all radio frequency bands allocated for AM(R)S and AMS(R)S;

b) Retain the VHF voice service as the primary medium for air-ground communication;

c) Supplement voice communication with data-link Flight Information Service (DFIS) applications including D-VOLMET, D-ATIS, DCL and other new applications related to the safety and regularity of flight to reduce congestion of the VHF spectrum, reduce workload, and enhance safety;

d) Retain 25 kHz as the minimum channel spacing in the band 118 – 136 MHz by 2025;

e) Use the frequency band 136 – 137 MHz exclusively for the air-ground VHF data-link applications;

f) Use PBCS approved CPDLC to provide DCPC (Direct controller pilot communications) for more efficient communication and enhanced ATM, especially to improve the capability of Trajectory Based Operation and enhance en-route situation awareness;

g) Retain HF voice for communication in areas where VHF coverage is not available;

h) Provide satellite voice (SATVOICE) where appropriate. States providing SATVOICE service should publish relevant details in their AIP;

i) Enhance AM(R)S and AMS(R)S applications within a performance-based communication and surveillance (PBCS) framework;

j) Strengthen the PBCS monitoring and improve its specifications as well as relevant safety assessments on emerging technologies for communication and surveillance supporting ATM operations in accordance with ICAO DOC 9869 and DOC 10037;

k) Encourage applying Satellite Communications (SATCOM) with suitable performance standards on safety data or voice applications in accordance with ICAO Annex 10 and DOC 10037;

l) Conform to the regional implementation priorities of ASBU, plan and implement new ATS communication services to meet the demands of aviation in the ASIA/PAC Region with the involvement of all stakeholders and taking account of costs and benefits. Taking Trajectory Based Operation (TBO) as thread, promote the ASBU operational concept and technology at the regional level.

Note:

Doc 10037: Global Operational Data Link (GOLD) Manual

Doc 9869: Performance-Based Communication and Surveillance (PBCS) Manual

Doc 9750: Global Air Navigation Plan

STRATEGY FOR IMPLEMENTATION OF THE AIR-GROUND DATA LINK IN THE ASIA/PAC REGION

Considering that:

a) The benefit of data communications to improve safety, efficiency and capacity through the reduction of voice communications and process automation to meet the operational requirement and consistent with the Air Traffic Management Operational Concept;

b) Current operation application of data link to support CPDLC, ADS-C, Data link Flight Information Service (DFIS) including D-VOLMET, D-ATIS and DCL, the need to maintain the functional service of these applications;

c) Current technology such as Satellite data link, HF data link, AeroMACS being acceptable for operations and standardized in SARPs and/or industry standards;

d) Ongoing implementation of VHF ACARS, VDL-Mode 2 AoA (ACARS over Aviation VHF Link Control), VDL-Mode 2 ATN and the need to improve data link communication coverage and capacity;

e) The need for PBCS implementation is prescribed in the Performance-Based Communication and Surveillance (PBCS) Manual (Doc 9869) to ensure that data communications operations are carried out in a safe and efficient manner;

f) The Global Operational Data Link (GOLD) Manual (Doc 10037) provides the globally harmonized guidance on data link service, CPDLC and ADS-C implementation, PBCS specifications and post-implementation monitoring and analysis;

g) Trajectory-Based Operations is fundamental for realizing the ICAO Global ATM Operational Concept and the evolution towards TBO is expected to align with the deployment of Aviation System Block Upgrades (ASBU) as described in the *Global Air Navigation Plan*, (ICAO Doc. 9750);

h) Development of standardized LDACS (L-Band Digital Aerospace Communication System);

i) The future growth of data communications to improve operations and the exchange of information including graphical meteorological information;

j) The need to assure global interoperability and harmonization; and

k) The need to assure communication safety and security.

THE GENERAL STRATEGY FOR THE IMPLEMENTATION OF THE AIR-GROUND DATA LINK INFRASTRUCTURE IN THE ASIA/PAC REGION SHOULD BE AS FOLLOWS:

a) Maintain or ensure compatibility of existing data links to support all current ATM and meteorological applications without change to the application or application specific system.

b) New deployment of VHF data link ground systems should be capable of supporting VDL-Mode 2 in addition to supporting ACARS based on ASBU Block Implementation.

c) In the near term there is no intent to implement VDL-Mode 3, VDL-Mode 4.

d) States are encouraged to work co-operatively to assist each other on a multinational basis to implement the air-ground ATN/IPS based on their operational requirements while maintaining service to support ATN/OSI during the transition period. States should consider implementing ATN OSI/IPS Gateway to support aircrafts equipped with either ATN/OSI or ATN/IPS in addition to existing ACARS.

e) HF voice services used in remote continental and oceanic areas should be transitioned to datalink communications.

f) Deploy new applications on aerodrome surface, terminal and en-route of flight which related flight safety and security based on current and new datalink technology in accordance with ICAO Annex10 and Doc 10037 to reduce congestion of the VHF spectrum, reduce workload, and enhance safety.

g) Apply an RCP specification related to the data link systems for relevant airspace complying with Doc 9869, and establish PBCS monitoring programs to assess against the RCP specification.

h) Encourage states to provide the service of VHF ACARS, VDL-Mode 2 AoA, VDL-Mode 2 ATN and the deployment of appropriate Satellite communications (SATCOM) on safety data or voice applications in accordance with ICAO Annex 10 and Doc 10037.

i) Undertake and monitor research and development of communications technology for the future evolution of data link services in line with ICAO Global Air Navigation Plan (GANP).

j) Implement the Security Services and associated policies and requirements specified in the standards, guidelines, and practices of ICAO SARPS, manuals and guidance materials to ensure continued security, safety and continuity of aeronautical communications services.

Note:

Near-Term: now to 10 years

Long-Term: 15+

Doc 10037: Global Operational Data Link (GOLD) Manual

Doc 9869: Performance-Based Communication and Surveillance (PBCS) Manual

Doc 9750: Global Air Navigation Plan

Doc 7030: Regional Supplementary Procedures

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Common Regional Virtual Private Network (CRV) Operations Group (OG) of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) (APANPIRG CRV OG)

OPERATIONS MANUAL

First Draft v1.3 - November 2020

Record of Amendment

A/L No	Date	Entered By	A/L No	Date	Entered By
1.0	11/09/2019	Vaughan Hickford			
1.1	15/01/2020	Vaughan Hickford			
1.2	14/10/2020	Vaughan Hickford			
1.3	10/11/2020	Vaughan Hickford			

Contents

1 PART I: FOREWORD

1.1 Introduction

a. The Common Regional Virtual Private Network Operations Group (CRV OG) Operations Manual is an informal publication prepared by the CRV Task Force, intended to provide, for easy reference of interested parties, a consolidation of material, particularly of a procedural nature, about the work of the CRV OG and its contributory bodies. It contains the Terms of Reference of the CRV OG established by the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) (Decision 27/34). It also contains the working arrangements and internal instructions developed by the Group for the practical application of its Terms of Reference.

b. The document describes; Terms of Reference; Composition; Position within ICAO; Working Arrangements; Rules of Procedure and Practices governing the Conduct of Business.

c. The framework of Part and Sections headings in addition to the page numbering has been devised to provide flexibility and the facilitation of the revision of additional or new material. Each Part includes an Introduction giving its purpose and status. A Table of Contents is also provided which serves also as a subject index and as a check list for the current pages.

d. All pages bear the date of issuance. Replacement pages will be issued as necessary and any portion of a page that has been revised will be identified by a vertical line in the margin. Additional arterial will be incorporated in the existing Sections or will be the subject of new Sections, as required.

e. Changes to text will be identified by a vertical line in the margin in the following manner;

   i. N for new or revised text;
   ii. E for editorial modification that do not alter the substance or meaning of the text;
   iii. D for deleted text

   iv. For practical reasons, this shall not be applied to title pages or to the routine insertion and deletion of Conclusions and Decisions. The absence of change bars, when data or page numbers have changed, will signify reissue of the section concerned or rearrangement of text (e.g., following an insertion or deletion with no other changes).

f. The Operations Manual will be distributed to Members and Observers of APANPIRG, the ICAO Secretariat, and to other States and international organizations participating in meetings, contributing to, or having interest in the work of the CRV OG and/or its Contributory Bodies.

2 PART II: TERMS OF REFERENCE, COMPOSITION AND POSITION IN ICAO OF THE CRV OG

2.1 Background

The establishment of APANPIRG CRV OG was proposed during the deliberations of the CRV Task Force (TF) as a dedicated group to provide oversight of the CRV operations and the performance of the CRV Service Provider. The APANPIRG CRV OG is formally established by APANPIRG Decision 27/34.

2.2 Terms of Reference

The Common Regional Virtual Private Network (VPN) Operations Group (OG) will provide oversight of the function and performance of the CRV and the performance of the Service Provider. The following are the activities to be performed:

a. Oversee the implementation of the CRV post Contract Award;
b. Manage issues arising from the transition with CRV TF, if any;
c. Co-ordinate and standardize the establishment or upgrade of CRV services as required;
d. Co-ordinate activities with other ICAO CRV OGs, if any, to make sure that decision making and communication with CRV Service Provider is consistent and timely;
e. Oversee the performance of the CRV Service Provider, including customer service;
f. Oversee the performance of the CRV network;
g. Oversee the escalation and solving by the CRV Service Provider of issues associated with the provision of the CRV, including safety and security related issues;
h. Assist with the resolution of issues associated with the provision of the CRV among the CRV Users as required, including safety and security related issues;
i. Assist with the migration of Aeronautical Fixed Services (AFS) onto the CRV, in line with the GANP and seamless ATM plan;
j. Maintain CRV OG documentation associated with the function, performance and management of the CRV, including the CRV OG Operations Manual, a list of CRV users and a record of variations to the common tender package;
k. Accept deliverables from the CRV Service Provider on behalf of the CRV Users as required;
l. Promote the use of CRV; and
m. Perform any other activity as required by CRV operations.

2.3 Reporting

The CRV OG will report to Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) through ACSICG and CNS SG.

2.4 Participation

The CRV OG will include all APAC Member States/Administrations, and any other organization as needed.

2.5 Conduct of the work

It is anticipated that the CRV OG will conduct its work primarily by Web Conferences, teleconferences and other electronic means of communications. Face to Face meetings of CRV OG may be required on an annual basis. The ICAO APAC Regional Office will provide secretariat support for the CRV OG.

2.6 Rapporteur

There will be two Co-Chairpersons of the CRV OG, one primarily responsible for Asia coordination and the other for Pacific coordination.

2.7 Position within ICAO

a) CRV OG shall be the guiding and co-ordinating organ for all activities conducted within ICAO concerning the Common Regional VPN for the Asia and Pacific Regions. However, it shall not assume authority vested in other ICAO bodies, except where such bodies have specifically delegated their authority to the Group. The activities of the Group shall be subject to review by the APANPIRG.

b) The work of groups established and meetings held within the framework of ICAO, concerned with the Asia and Pacific CRV shall be coordinated with the CRV OG to ensure full harmonization with all regional activities regarding the development and operation of the Asia/Pacific system.

3 PART II: WORKING ARRANGEMENTS

3.1 APANPIRG Procedural Handbook

The CRV shall be guided by the APANPIRG Procedural Handbook to ensure that work arrangements are consistent with its parent body

3.2 Administration of the CRV OG

c) The CRV shall be administered as follows:

i. by two (2) Chairpersons, one elected from the Representatives designated by member States of the Group from ASIA Region and one from the PACIFIC region; and

ii. by ICAO Regional Director, Asia and Pacific Office designated as Secretary CRV OG by the Secretary General of ICAO. In the execution of duties the Secretary will be supported by the Asia and Pacific Regional Office.

d) The Chairpersons, in close co-ordination with the Secretary, shall arrange for the most efficient working of the Group. The Group shall always work with a minimum of formality and paperwork.

e) Between meetings of the CRV OG, some subjects may be dealt with by correspondence among appointed Representatives of Member States through the Secretary of the CRV OG. However, if States are to be consulted this should be done through the ICAO Regional Director, Asia and Pacific Office.

Service Strategy

- Strategy Management
- Service Portfolio Management
- Financial Management
- Business Relationship Management
- Demand Management

Service Design

- Service Catalogue Management
- Availability Management
- Capacity Management
- IT Service Continuity Management
- Service level Management
- Design Co-ordination
- Information Security Management
- Supplier Management

Service Transition

- Transition Planning and Support
- Change Management
- Service Asset & Configuration Management
- Release and Deployment Management
- Service Validation and Testing Management
- Change Evaluation
- Knowledge Management

Service Operation

- Event Management
- Incident Management
- Request Fulfilment
- Problem Management
- Access Management

Continual Service Improvement

- Service Review
- Process Evaluation
- Definition of CSI Initiatives
- Monitoring CSI Initiatives

4 PART III: SERVICE STRATEGY

Service Strategy

- Strategy Management
- Service Portfolio Management
- Financial Management
- Business Relationship Management
- Demand Management

4.1 Strategy Management

Process Objective: To assess the service provider's offerings, capabilities, competitors as well as current and potential market spaces in order to develop a strategy to serve customers. Once the strategy has been defined, Strategy Management for IT Services is also responsible for ensuring the implementation of the strategy.

a) Reduce telecommunication costs in most cases (to be confirmed by local CBA)
b) Enable integration in the aeronautical infrastructure and enhanced services (GANP, regional objectives)
c) Enhance information security
d) Provide a standardized interface for AFS (instead of multiple protocols, some of which are obsolescent)
e) Rationalize coordination for network management and enhancement
f) Respond to Air Traffic requirements in a timely and standardized manner
g) Coordination with Other Regional Private Networks
h) Promote the use of CRV

4.2 Service Portfolio Management

Process Objective: To manage the service portfolio. Service Portfolio Management ensures that the service provider has the right mix of services to meet required business outcomes at an appropriate level of investment.

- Criteria for services to be added to CRV.
- POC of new services.

4.3 Financial Management

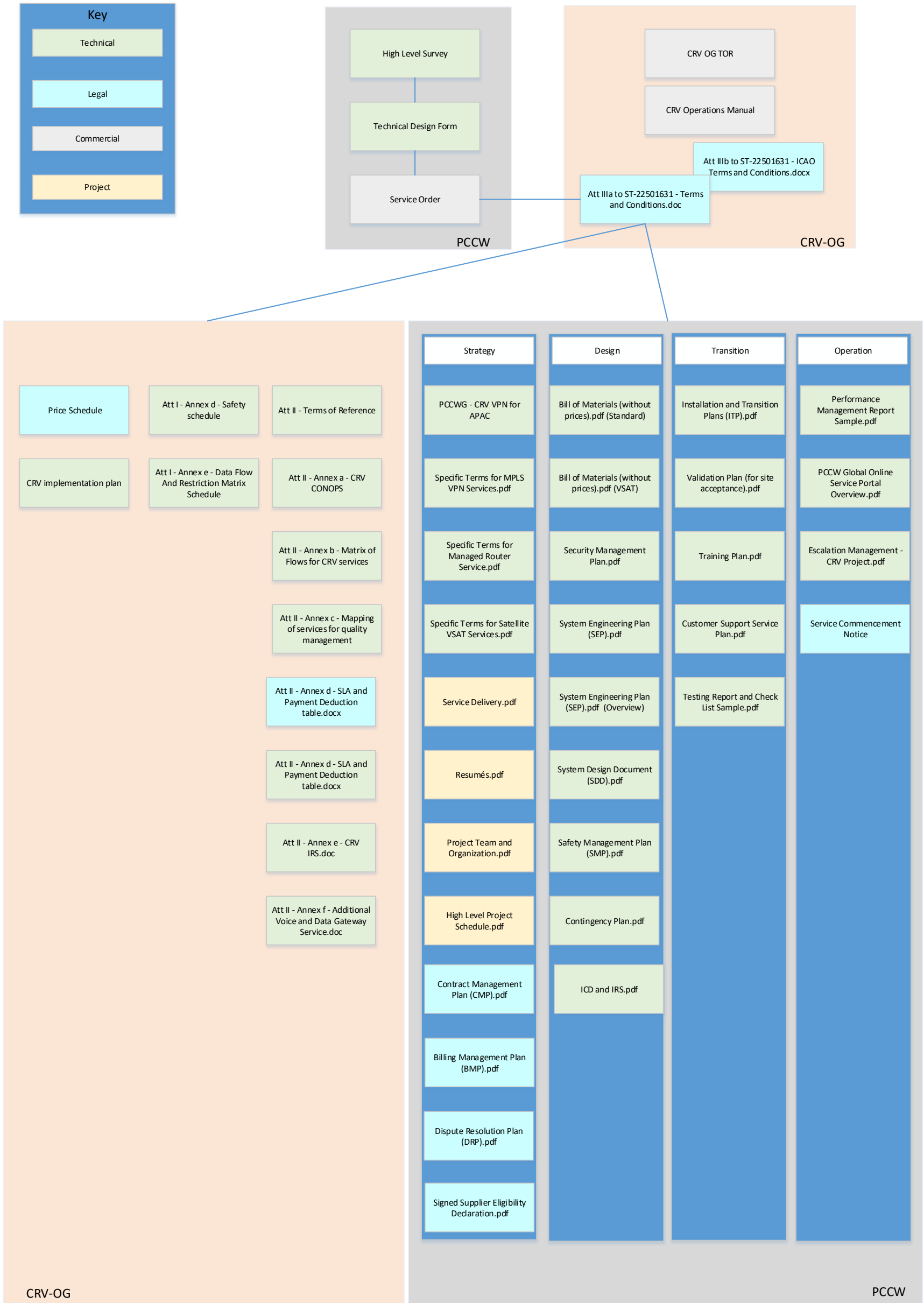
Process Objective: To manage the service provider's budgeting, accounting and charging requirements.

4.4 Business Relationship Management

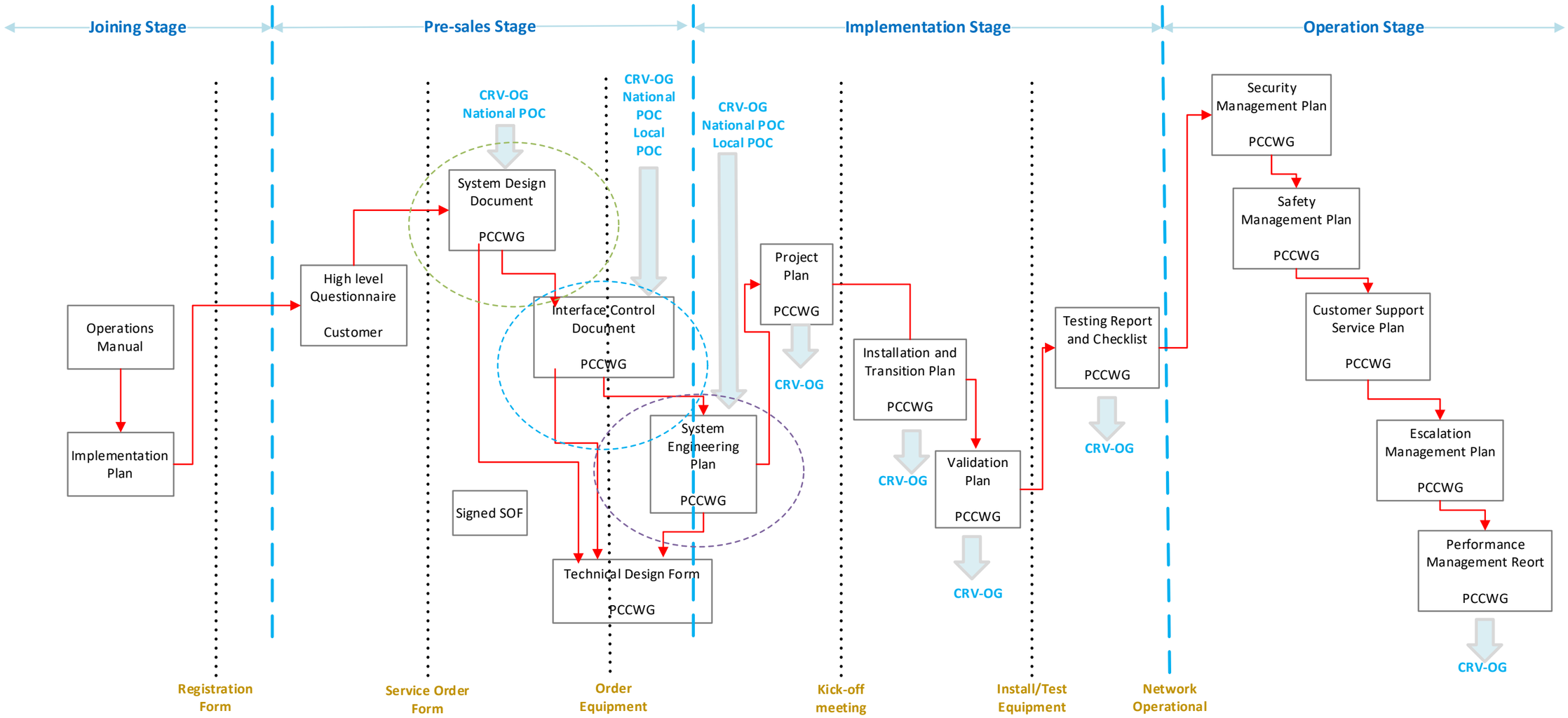
Process Objective: To maintain a positive relationship with customers. Business Relationship Management identifies the needs of existing and potential customers and ensures that appropriate services are developed to meet those needs.

4.4.1 Legal Documentation

The list below shows the precedence of the legal documents that pertains to CRV.



4.4.2 Design and Implementation document flow



4.4.3 Common Package

The Common Package is the common set of documents required to be used to join and operate the CRV Network.

The documents and how they relate to the stages in the Design and Implementation document flow is detailed below.

This is located on the CRV Users Portal here: Common Package.

4.4.4 Joining Stage

a. Operations Manual

This provides the Policies, Processes and Procedures for the Strategy, Design, Transition and Operation of the CRV network.

b. Implementation Plan

The purpose of this Implementation Plan is to provide guidance for all States/ Administrations on the operation requirements for implementing the Common aeRonautical Virtual Private Network (CRV) used in Asia/ Pacific (APAC) Region and the roadmap for implementation.

It contains information on Points of Contacts for each State, Allocated IP addressing for States and Service Providers, proposed implementation dates and suggested tests.

IP Addressing is also listed on the APAC CRV Portal.

c. Registration Form

Provides the information required to connect to CRV as an ANSP.

Example of the Registration Form

4.4.5 Pre-Sales Stage

a. High Level Questionnaire

This provides the high level information to PCCW to be able to provide the Service Order Form (SOF) for signing.

Example of the High Level Questionnaire

b. Service Order Form

Provides the information to PCCW to provide the connection and initiate billing.

Example of the Service Order Form.

c. System Design Document

This is the over-arching Design Document for the CRV Network.

Example of System Design Document

d. Interface Control Document

Example of Interface Control Document

e. Technical Design Form

Example Technical Design Form

f. System Engineering Plan

This is a living document covering the technical aspects of the CRV implementation. Any changes can be updated by the User or PCCW.

Example of a System Engineering Plan

4.4.6 Implementation Stage

a. System Engineering Plan

This is a living document covering the technical aspects of the CRV implementation. Any changes can be updated by the User or PCCW.

Example of a System Engineering Plan

b. Project Plan

Provided to each state post signing of the Contract and is only relevant to that state. It is updated regularly by the PCCW Project manager

Example of a Project Plan

c. Installation and Transition Plan

Example of an Installation and Transition Plan

d. Validation Plan

This is PCCW's testing plan post implementation of the Managed Service

Example of a Validation Plan

e. Testing and Report Checklist

This is the result of PCCW's Testing plan post implementation of the Managed Service and is accompanied by the Service Commencement Notice (SCN)

Testing and Report Checklist

4.4.7 Operation Stage

a. Security Management Plan

Example of the Security Management Plan

b. Safety Management Plan

Example of a Safety Management Plan

c. Customer Support Service Plan

This details the contact details for any Problems or Incidents that the State may encounter.

Example of a Customer Support Service Plan

d. Escalation Management Plan

This details the contact details if the need arises to escalate any Tickets. It also details the escalation criteria

Example of an Escalation Management Plan

e. Performance Management Report

Example of a Performance Management Report

4.5 Demand Management

Process Objective: To understand, anticipate and influence customer demand for services. Demand Management works with Capacity Management to ensure that the service provider has sufficient capacity to meet the required demand.

5 PART IV: SERVICE DESIGN

Service Design

- Service Catalogue Management
- Availability Management
- Capacity Management
- IT Service Continuity Management
- Service level Management
- Design Co-ordination
- Information Security Management
- Supplier Management

5.1 Service Catalog Management

Process Objective: To ensure that a Service Catalogue is produced and maintained, containing accurate information on all operational services and those being prepared to be run operationally. Service Catalogue Management provides vital information for all other Service Management processes: Service details, current status and the services' interdependencies.

5.1.1 Requirements

a. Latency (from the ADDENDUM TO THE SPECIFIC TERMS)

Locations	Average Round Trip Delay
Within the cities specified in Asia (On-net/Off-net)	200ms
Within the cities specified in Oceania (On-net/Off-net)	200ms
Between the cities specified in Middle East and Europe (On-net/Off-net)	200ms
Within the cities specified in Europe (On-net/Off-net)	200ms
Other cities combination not specified above	600ms

b. Availability (from the ADDENDUM TO THE SPECIFIC TERMS)

Service Package	Service Availability
Package A	99.97%
Package B	99.5%
Package B+	99.95%
Package C	99.5%
Package C+	99.7%
Package D	99.5%

c. Jitter (from the ADDENDUM TO THE SPECIFIC TERMS)

The Target Average Jitter Level for voice application and data application is 15ms and 250ms respectively

d. QoS/DSCP markings

Service class name	DSCP Name
Border Gateway Protocol (BGP)	CS6
Voice	EF
Voice Signaling	CS5 (preferred) EF (if CS5 is not possible)
ADS-B	CS4
AFTN, ATN.	AF21
All traffic not otherwise defined.	DF (CS0)

e. Security

Security is the responsibility of each of the ANSPs. Basic security is provided by PCCW utilising Route Filtering and GRE tunnels between ANSP sites.

5.1.2 Criteria to add a new service

a. Considerations

i. Connecting a Service Provider / Service Consumer (SPSC) to the CRV can be initiated by any party that identifies a need for an SPSC to connect to it. The following should be consider by the SPSC and the CRV-Member state.

ii. Service Provider (SP) is defined as a company that provides aeronautical service using the CRV as the means of communication.

iii. Service Consumer (SC) is defined as a company or organisation that consumes aeronautical information using the CRV as the means of communication.

iv. The SPSC should be referred to PCCW to enable an initial discussion with them to assess the feasibility of connecting to the CRV. During this discussion the SPSC should clarify:

v. Interfaces

vi. Data transfer rates

vii. DSCP marking etc.

viii. It is recommended that Service Providers use public ip addressing for the delivery their services.

ix. It is recommended that Service Consumers are provided with a 10.x.x.x ip addressing from the CRV Member State where the PCCW NID is installed.

x. SPSCs will NOT be a member of the CRV Operations Group (OG). The OG may establish a CRV user group that could facilitate discussion on the use of the CRV by SPSCs.

xi. SPSCs will need to adhere to the Common Regional VPN (CRV): System Design Document (SDD). Substantive changes to the SSD MUST be endorsed by the CRV OG.

xii. CRV member states should consider ICAO Doc 9855 AN/459 Guidelines on the Use of the Public Internet for Aeronautical Applications as guidance when they are the Primary sponsor.

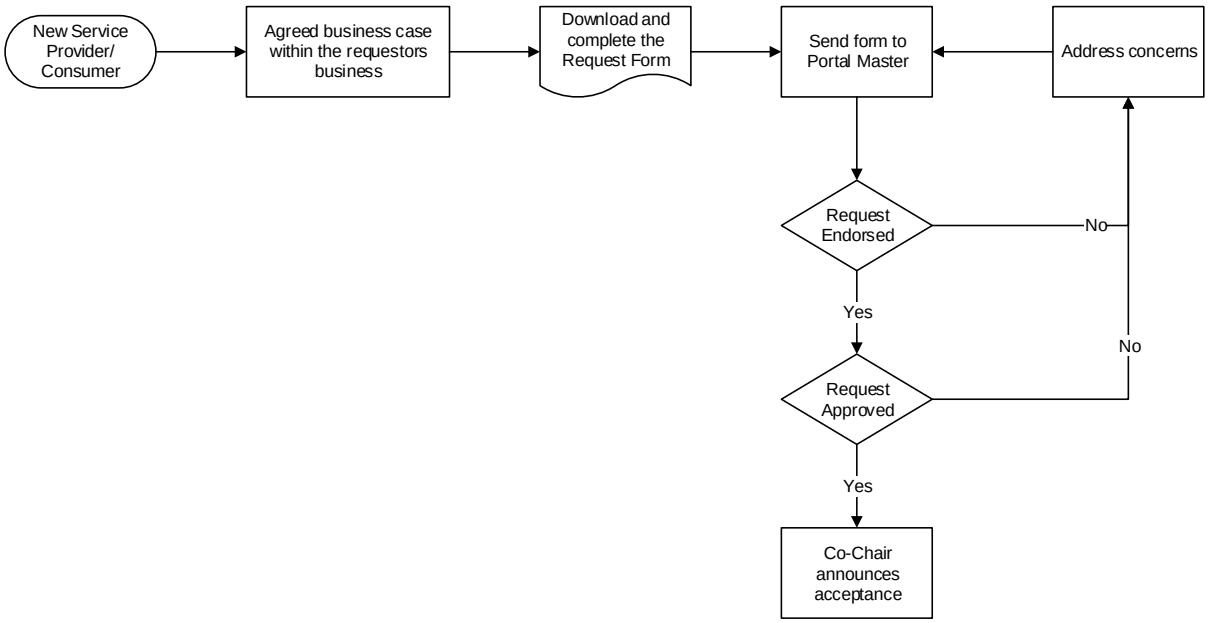
xiii.

xiv. The CRV OG IS NOT responsible for the accreditation/certification/validation of a Service Provider, but must ensure that the all reasonable steps have been taken to ensure that the Service Provider has sufficient systems and process in place to provide their service over the CRV.

xv.

xvi. Service Consumers and CRV members SHOULD ensure that when obtaining a Service from a Service Provider that the service meets their operational service requirements.

b. Process



1. Procedure.

i. The information required in the connection request, should be presented in English and in a clear and logical format. The following process will be used for an SPSC to obtain approval connect to the CRV:

ii. Provide a business justification including Benefits Realization for joining the CRV

iii. For a Service Provider:

a. provide a documentation using Section 2.3 ACCREDITATION OF AN IASP in ICAO Doc 9855 AN/459 as a guide including a cyber-security plan.

iv. For a Service Consumer; at a minimum, provide a CRV connection plan and cyber-security plan on how they will shield the CRV from their organisation.

v. Obtain a Primary CRV member state to sponsor their connection to the CRV.

vi. Obtain business justification from Primary Sponsor to support their request.

vii. Obtain a Secondary CRV member state to sponsor their connection to the CRV based on the information above.

viii. The information provided above, will be provided to the CRV OG via the APAC CRV portal.

ix. CRV OG members will be notified and have 25 business days to review and address any concerns that they may have with the request.

x. After the 25 days, if the majority of reviews by CRV OG members are endorsed, the CRV OG chairs will review the request.

xi. For the request to be approved, both CRV OG C-Chairs need to approve the request.

xii. A Document/Certificate will be provided to the primary sponsor that can used to verify that the SPSC is approved to connect the CRV.

xiii. The on boarding of Service Provider / Service Consumer will be supported by the Airways New Zealand provided APAC CRV SharePoint portal. There will be word forms to facilitate the information and these forms will be migrated to an automated SharePoint Workflow as soon as practical.

Service Provider / Service Consumer will be required to undertake the following:

Provide a business justification including Benefits Realisation for joining the CRV

Provide a High Level System Design oh how their Service could potentially connect to the CRV.

Service Providers to use Public IP Addressing

Service Consumers to use the ICAO allocated IP addresses

Interfaces

Data transfer rates

DSCP marking

5.2 Availability Management

Process Objective: To define, analyse, plan, measure and improve all aspects of the availability of IT services. Availability Management is responsible for ensuring that all IT infrastructure, processes, tools, roles etc. are appropriate for the agreed availability targets.

5.2.1 Monthly Performance Management Reports

Provided by PCCW to each State that has joined CRV covering:

- Router report
- Interface report
- QoS report
- Traffic report

(More SLA data is available from the PCCW Portal)

5.2.2 Monthly Operations Reports

Provided by PCCW to each State that has joined CRV covering:

- Active Service Inventory
- Site Availability (More SLA data is available from the PCCW Portal)
- Ticket Statistic
  - Problem Statistic
  - Incident Statistic
  - Requests
  - Maintenance
- Ticket Details
- AOB

5.2.3 Monthly meetings with PCCW

Conducted via Telephone conference that is hosted by PCCW, with each State that has joined CRV to discuss:

- States Performance Management Report (information from the Portal)
- States Operations Report (Service Report)

5.2.4 Quarterly Operations Reports

Provided by PCCW to the OG covering:

- Implementation progress
- Site Availability (More SLA data is available from the PCCW Portal)
- Ticket Statistic
  - Problem Statistic
  - Incident Statistic
  - Requests
  - Maintenance
- Ticket Details
- AOB

5.2.5 Annual OG meetings

- Implementation progress
- Site Availability (More SLA data is available from the PCCW Portal)
- Ticket Statistic
  - Problem Statistic
  - Incident Statistic
  - Requests
  - Maintenance
- Ticket Details
- Network Utilisation
- AOB

5.2.6 Root cause analysis reports

Provide detail post every Incident to the affected State and the APAC CRV OG. Include these in each of the Monthly, Quarterly and Annual Report.

5.2.7 Notifications of Maintenance

Ensuring that all affected parties of maintenance releases are updated as appropriate.

5.2.8 Diversity Audits

A rolling audit of States/Sites physical and logical connectivity based on the information provided in the Service Commencement Notice.

5.2.9 Testing failover

State LOA/MOU/Technical Letter for carrying out failover testing to ensure service continuity.

5.3 Capacity Management

Process Objective: To ensure that the capacity of IT services and the IT infrastructure is able to deliver the agreed service level targets in a cost effective and timely manner. Capacity Management considers all resources required to deliver the IT service, and plans for short, medium and long term business requirements.

Co-ordinate and standardize the establishment or upgrade of CRV services as required

Oversee the performance of the CRV network;

5.4 IT Service Continuity Management

Process Objective: To manage risks that could seriously impact IT services. ITSCM ensures that the IT service provider can always provide minimum agreed Service Levels, by reducing the risk from disaster events to an acceptable level and planning for the recovery of IT services. ITSCM should be designed to support Business Continuity Management.

a) CRV Contingency Operations

from CRV TF/6 report there is this report:

The meeting discussed again the contingency plan in relation to the safety case. To mitigate the risk of a total or major failure (such as IT disaster that would affect the whole CRV), two layers of process would have to be articulated:

- *the procedures and measures planned and implemented by PCCW; and*
- *consistently, the procedures and measures planned and implemented by the CRV Users, as part of their contingency plan required by ICAO SARPS.*

Furthermore, the meeting agreed that procedures to mitigate the total failure of CRV should be discussed by CRV OG as part of the contingency planning.

5.5 Service Level Management

Process Objective: To negotiate Service Level Agreements with the customers and to design services in accordance with the agreed service level targets. Service Level Management is also responsible for ensuring that all Operational Level Agreements and Underpinning Contracts are appropriate, and to monitor and report on service levels.

5.6 Design Co-ordination

Process Objective: To coordinate all service design activities, processes and resources. Design coordination ensures the consistent and effective design of new or changed IT services, service management information systems, architectures, technology, processes, information and metrics.

Change Requests

Engineering Package

Legal Documents

Dial Plan

5.7 Information Security Management

Process Objective: To ensure the confidentiality, integrity and availability of an organization's information, data and IT services. Information Security Management usually forms part of an organizational approach to security management which has a wider scope than the IT Service Provider.

Security is the responsibility for the implementation of security controls to ensure the integrity of services.

As a minimum the connectivity states is via GE Tunnels.

Other methods of ensuring the security of the connectivity are:

a. Utilising as small an IP Address range as possible.
b. Only advertising relevant IP addresses.
c. Only accepting verified IP Routes when required.
d. Utilising firewalls.
e. Utilising NAT.
f. Utilising Intrusion Protection Software (IPS)

It is recommended that external security advice is sought.

5.8 Supplier Management

Process Objective: To ensure that all contracts with suppliers support the needs of the business, and that all suppliers meet their contractual commitments.

a) Oversee the performance of the CRV Service Provider, including customer service;

b) Oversee the escalation and solving by the CRV Service Provider of issues associated with the provision of the CRV, including safety and security related issues

6 PART V: SERVICE TRANSITION

Service Transition

- Transition Planning and Support
- Change Management
- Service Asset & Configuration Management
- Release and Deployment Management
- Service Validation and Testing Management
- Change Evaluation
- Knowledge Management

6.1 Transition Planning and Support

Process Objective: To plan and coordinate the resources to deploy a major Release within the predicted cost, time and quality estimates.

a) Covered by the Implementation Plan

6.2 Change Management

Process Objective: To control the lifecycle of all Changes. The primary objective of Change Management is to enable beneficial Changes to be made, with minimum disruption to IT services.

All changes are to be conveyed to PCCW via their Change Request Form. And covered by the Change Management Process as found in the Common Package.

6.3 Service Asset and Configuration Management

Process Objective: To maintain information about Configuration Items required to deliver an IT service, including their relationships.

a) Maintain CRV OG documentation associated with the function, performance and management of the CRV, including the CRV OG Operations Manual, a list of CRV users and a record of variations to the common tender package;

   This information is collated in the following ways:

   CRV Operations Manual – APAC Portal
   A list of CRV users – Registrations page on the APAC portal
   Record of Variations is found in the APAC CRV Portal in the Common Package Folder

6.4 Release and Deployment Management

Process Objective: To plan, schedule and control the movement of releases to test and live environments. The primary goal of Release Management is to ensure that the integrity of the live environment is protected and that the correct components are released.

a) Oversee the implementation of the CRV post Contract Award;

b) Manage issues arising from the transition with CRV TF, if any

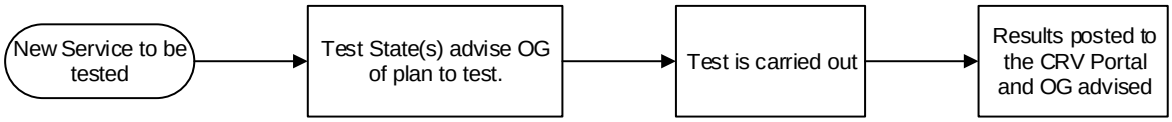
6.5 Service Validation and Testing Management

Process Objective: To ensure that deployed Releases and the resulting services meet customer expectations, and to verify that IT operations is able to support the new service.

a) Accept deliverables from the CRV Service Provider on behalf of the CRV Users as required;

b) Refer to the CRV Implementation Plan

c) New Services



New services being tested by any state,
Notifies OG intention to test as soon as practical.
Advises CRV OG and PCCW 48hrs prior to testing

Testing is to be carried out with a DSCP marking of DF so as to avoid impacting other services.

The results of the tests are to be posted on the CRV portal and the OG advised of the posting.

6.6 Change Evaluation

Process Objective: To assess major Changes, like the introduction of a new service or a substantial change to an existing service, before those Changes are allowed to proceed to the next phase in their lifecycle.

6.7 Knowledge Management

Process Objective: To gather, analyse, store and share knowledge and information within an organization. The primary purpose of Knowledge Management is to improve efficiency by reducing the need to rediscover knowledge.

a) All information relating to the ongoing operation of the network shall be retained in the APAC CRV Portal

There will be a link to the portal from the ICAO APAC page.

b) To add items to the portal.

c) To Workflow a document.

7 PART VI: SERVICE OPERATION

7.1 Event Management

Process Objective: To make sure CIs and services are constantly monitored, and to filter and categorize Events in order to decide on appropriate actions.

a) Managed by PCCW

7.2 Incident Management

Process Objective: To manage the lifecycle of all Incidents. The primary objective of Incident Management is to return the IT service to users as quickly as possible.

a) Managed by PCCW

After an incident, an incident report (IR) can be provided upon request.

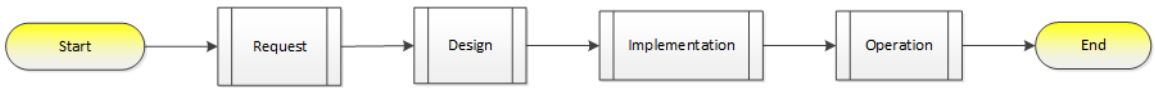
Under normal circumstances, an IR would be ready in 3 working days.

An IR Form template is provided in the Common Package as an example.

7.3 Request Fulfilment

Process Objective: To fulfil Service Requests, which in most cases are minor (standard) Changes (e.g. requests to change a password) or requests for information.

- Process

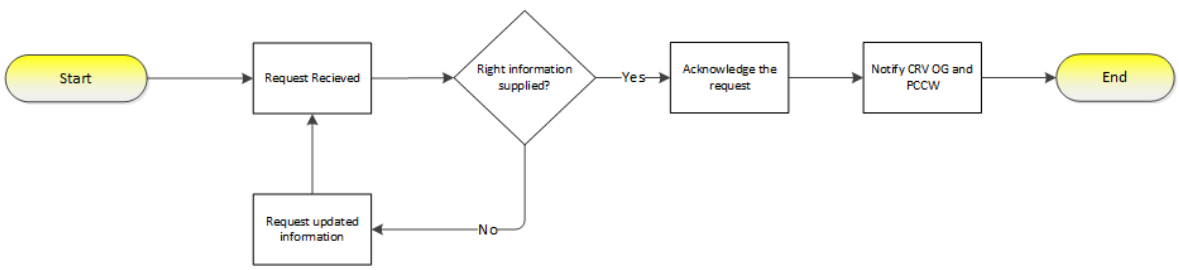


- Procedure
  - Request

    There are four types of requests:

    1. Request to join CRV as a user.
    2. Request to change
    3. Request to add a new service
    4. Request to terminate the CRV connection

    - Process



- Procedure

1. Details on how to join CRV are posted on the ICAO APAC and ICAO MID pages.
2. An initial request is sent to the APAC CRV Portal Administrator requesting to join, leave or add a new connection to CRV.
3. Upon receipt of the request to join, leave or add new connection to CRV, a registration form is provided.
4. Upon receipt of the registration form to join or leave, check the content is complete:
    a. ANSP Making the Request
    b. Technical Point of Contact
    c. State(s) connecting to.
    d. Proposed services between ANSPs
    e. Proposed go live/removal date
5. If complete, acknowledge the request with a link to the Common Package, the Operations Group Manual and the Implementation Plan and the CRV Portal.
6. If not complete, request updated information.
7. Notify the CRV OG and PCCW.
8. Update the Registrations List.

- Design
    - Go to Design Co-ordination
- Implementation
    - Go to Change Management
- Operation
    - Go to Service Operation

7.4 Problem Management

Process Objective: To manage the lifecycle of all Problems. The primary objectives of Problem Management are to prevent Incidents from happening, and to minimize the impact of incidents that cannot be prevented. Proactive Problem Management analyses Incident Records, and uses data collected by other IT Service Management processes to identify trends or significant Problems.

a) PCCW Initiated – Follow the Customer Support Service Plan

b) Authority Initiated

a. Troubleshoot local connectivity

b. Polling the NID. On the ANSP NID provided by PCCW, a local loop back will be configured using a specified IP address from the allocated range of IP addressing. This will be called the troubleshooting IP address.

c. Troubleshoot with peers

d. Fault with PCCW following the Customer Support Service Plan

7.5 Access Management

Process Objective: To grant authorized users the right to use a service, while preventing access to non-authorized users. The Access Management processes essentially execute policies defined in Information Security Management. Access Management is sometimes also referred to as Rights Management or Identity Management.

a) Physical Access Control

   i. The Cabinet for Core Routers are locked

   ii. The network main PoP sites are under 7x24 CCTV monitoring and recording

b) Remote Network Access Control

   i. The remote access of Cores and CE routers are controlled by access-list ACL that is only allow authorized terminal of management systems.

   ii. The TACACS is deployed to allow the authorized persons of PCCWG to access Core Routers or CE routers as AAA clients.

c) Portal Access

   Review member's access annually.

PART VII: CONTINUAL SERVICE IMPROVEMENT

Continual Service Improvement

- Service Review
- Process Evaluation
- Definition of CSI Initiatives
- Monitoring CSI Initiatives

7.6 Service Review

Process Objective: To review business services and infrastructure services on a regular basis. The aim of this process is to improve service quality where necessary, and to identify more economical ways of providing a service where possible.

Volunteers for each section

Small groups around these sections.

Report back up to the master document owner

Approval by Chairs

Approval by APANPIRG

Master owner of the document updates and publishes every two months?

Quarterly conference call to start with to update the document.

7.7 Process Evaluation

Process Objective: To evaluate processes on a regular basis. This includes identifying areas where the targeted process metrics are not reached, and holding regular bench markings, audits, maturity assessments and reviews.

7.8 Definition of CSI Initiatives

Process Objective: To define specific initiatives aimed at improving services and processes, based on the results of service reviews and process evaluations. The resulting initiatives are either internal initiatives pursued by the service provider on his own behalf, or initiatives which require the customer's cooperation.

7.9 Monitoring CSI Initiatives

Process Objective: To verify if improvement initiatives are proceeding according to plan, and to introduce corrective measures where necessary.

8 PART VIII
DEFINITIONS

8.1 Definitions

A Service is defined as any service provided over the CRV supporting Meteorological Service for International Air Navigation or Air Traffic Control Services.

Service Provider / Service Consumer (SPSC)

Incident - An Incident is defined as an unplanned interruption or reduction in quality of an IT service (a Service Interruption).

Eg. A link has been flapping in the network causing reroutes.

Problem - A cause of one or more Incidents. The cause is not usually known at the time a Problem Record is created.

Eg. Link flaps have been caused by unplanned work by a third party.

Asia and Pacific Office

ASIA PACIFIC FLIGHT INSPECTION GUIDANCE MATERIAL

First Edition

AMENDMENTS

Amendments are announced in the supplements to the *Publications Catalogue*; the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS, CORRIGENDA AND ADDENDA

AMENDMENTS		
No.	Date	Entered by

CORRIGENDA / ADDENDA		
No.	Date	Entered by

PREFACE

This publication was prepared in response to a recommendation from the "Seminar on Flight Inspection and Procedure Validation (FIPV)" held in the ICAO Asia and Pacific (APAC) Regional Office, Bangkok, Thailand from 24 to 27 September 2019 with content contribution from volunteer States / Administrations and industry partners. It is decided to complement existing Standards and Recommended Practices (SARPs) to provide guidance on flight inspection and to serve as a reference upon which States / Administrations can develop their own specific practices and procedures.

The guidance material is developed with the experiences and knowledge among APAC States / Administrations and industry partners and includes recommendations of key activities and milestones in planning, execution, and delivery of a flight inspection. Useful materials, including sample flight inspection reports are also included for reference. This guidance material can hopefully facilitate and be useful to States / Administrations, especially for those without a national Flight Inspection Service Provider (FISP) and with difficulties when conducting flight inspection.

This guidance material is not intended to and shall not replace the relevant flight inspection requirements stipulated in Annex 10 and Doc 8071. In the event of any inconsistency or conflict between this document and Annex 10 and Doc 8071, Annex 10 and Doc 8071 shall take precedence.

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- Hong Kong Civil Aviation Department, China

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GLOSSARY

SYMBOLS AND UNITS

DDM	Difference in the depth of modulation
Ft	Feet
Kg	Kilogram
Km/h	Kilometers per hour
Kw	Kilowatt
M	Meter
NM	Nautical mile
QNH	Atmospheric pressure adjusted to mean sea level

ABBREVIATIONS

ADS-B	Automatic Dependent Surveillance – Broadcast
AI	Artificial Intelligence
AIP	Aeronautical Information Publication
ANSP	Air Navigation Service Provider
AOC	Air Operator's Certificate
APAC	Asia and Pacific
ATC	Air Traffic Control
ATM	Air Traffic Management
ATS	Air Traffic Service
CCC	Crew Coordination Concept
CNS	Communication, Navigation and Surveillance
COVID-19	Coronavirus Disease 2019
CRM	Crew Resource Management
DME	Distance Measuring Equipment
DVOR	Doppler VHF Omni-Directional Range
EASA	European Union Aviation Safety Agency
EFB	Electronic Flight Bag
FAA	Federal Aviation Administration
FIPV	Flight Inspection and Procedure Validation
FISP	Flight Inspection Service Provider
FTL	Flight Time Limitation
GBAS	Ground Based Augmentation System
GLS	GNSS Landing System
GNSS	Global Navigation Satellite System
GP	Glidepath
ICAO	The International Civil Aviation Organization
ICASC	The International Committee for Airspace Standards and Calibration
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LOC	Localizer
LSALT	Lowest Safe Altitude
MSA	Minimum Sector Altitude
MVA	Minimum Radar Vector Altitude
NAVAID	Navigation Aid
NDB	Non Directional Beacon
NOTAM	Notice to Airmen
PANS-Ops	Air Navigation Services – Aircraft Operations
PAPI	Precision Approach Path Indicator
PSR	Primary Surveillance Radar
RNAV	Area Navigation
RNP	Required Navigation Performance
RPAS	Remotely Piloted Aircraft Systems
SARPs	Standards And Recommended Practices
SMS	Safety Management System
SOPs	Standard Operating Procedures
SORA	Specific Operations Risk Assessment
SSR	Secondary Surveillance Radar

TAR	Test Accuracy Ratios
TERPs	Terminal Instrument Procedures
TRM	Team Resource Management
TSO	Technical Standard Orders
UAV	Unmanned Aerial Vehicle
VASI	Visual Approach Slope Indicator
VHF	Very High Frequency
VMC	Visual Meteorological Conditions

Chapter 1

INTRODUCTION

This material was developed in response to the recommendation from the Seminar on Flight Inspection and Procedure Validation (FIPV) held in the ICAO APAC Regional Office, Bangkok, Thailand from 24 to 27 September 2019, considering the typical need of States / Administrations without a national FIS provider and some recommended measures necessary for conducting flight inspection at night.

1.1 OBJECTIVE

1.1.1 In accordance with the ICAO Annex 10 Volume I and Document 8071 requirements, flight inspection has to be conducted periodically to ensure accuracy, reliability and integrity of the signals-in-space from the air navigation facilities, and that the radio navigation systems meet the SARPs in Annex 10.

1.1.2 While flight inspection could also be conducted for surveillance facilities and/or other purposes such as flight procedure validation, VHF coverage checking, etc., this guidance material focuses on flight inspection for air navigation and surveillance facilities and is a sharing and representation of common practices existing in a number of States with considerable experiences in flight inspection.

1.1.3 This guidance material introduces and describes different stages in flight inspection for air navigation facilities, including planning, conducting and accepting the report that all tolerances are met. It is not intended to recommend specific FISP(s) or equipment to be used, but rather to provide general details and guidelines in the arrangement of flight inspection for States' own consideration.

1.2 SCOPE

1.2.1 This guidance material describes general reference in conducting flight inspection, including resources planning, roles and responsibilities of involving parties and identification of stakeholders. It also provides guideline in communication with stakeholders and criteria on planning and scheduling flight inspection.

1.2.2 This document introduces example flight inspection procedures for Instrument Landing System (ILS) including visual aids, Doppler Very High Frequency Omni-Directional Range (DVOR), Distance Measuring Equipment (DME), Primary Surveillance Radar and Secondary Surveillance Radar (PSR / SSR) and discusses about the arrangement for flight inspection at night and also emergency flight inspections.

1.2.3 Reference is also given on the example flight inspection system performance specifications and associated Test Accuracy Ratios (TAR) and the workflow on reporting of flight inspection results. Sample flight inspection records and reports are also shared in this document for States to make reference with.

Chapter 2

PLANNING FOR FLIGHT INSPECTION

2.1 GENERAL

2.1.1 General Setup and Resources Planning

2.1.1.1 General setup – there are 2 typical scenarios of flight inspection arrangements:

(a) State has its own flight inspection unit; or

(b) Engagement of external FISP.

2.1.1.2 State's own flight inspection unit will be:

(a) Able to activate within a short period of time during emergency (high flexibility);

(b) Particularly useful when State has large number of facilities / aerodromes to be flight inspected; and

(c) Likely regulated by State.

2.1.1.3 Engagement of external FISP will be:

(a) More cost effective when State has small number of facilities to be flight inspected;

(b) More feasible when the State may not have the necessary expertise;

(c) More flexible to change FISP to meet the required service performance; and

(d) Little or no control when an emergency flight inspection is required.

2.1.1.4 General planning before flight inspection typically includes the following:

(a) Determine types of flight inspection required (commissioning or routine) and periodicity for routine ones;

(b) Identify facilities to be flight inspected;

(c) Determine type of aircraft used for flight inspection, for example using jet aircraft for high level (i.e. FL350 and above) radar coverage check;

(d) Check with apron operations on where the inspection aircraft can park and identify any traffic/timing restrictions for its taking off and landing;

(e) Plan the time of flight inspection, after consulting operations;

(f) Develop draft flight inspection schedule and flight inspection profiles as well as proposed date for brief and debrief;

(g) Notify parties involved/affected by draft flight inspection schedule and flight inspection profiles. Parties involved/affected could be ATC, runway maintenance team, military, ground handlers, Navaids & Surveillance facilities managers, Navaids & Surveillance maintenance staff, airfield lighting / Precision Approach Path Indicator (PAPI) maintenance team;

(h) Conduct flight inspection briefing with involved / affected parties;

(i) Issue Notices to Airmen (NOTAMs) for any change / cancellation of runway maintenance works; and

(j) Develop list of contact details of parties involved in the flight inspection.

2.1.2 Roles and Responsibilities of the Flight Inspection Service Provider (FISP) Including Crew Resources Management

FISP is the main party to provide safe and reliable flight inspection services. Selection of an appropriate FISP is a key successful factor for flight inspection.

2.1.2.1 Roles

(a) Assist Air Navigation Service Provider (ANSP) in planning, scheduling and conducting the flight inspection;

(b) Be familiar with the airspace / airport to conduct safe and efficient flight inspection with minimum impact to normal traffic; and

(c) Provide routine, commissioning or ad-hoc (special or urgent) flight inspection services.

2.1.2.2 Responsibilities

(a) Assist ANSP to ensure no equipment (e.g. navigation aids) would expire the validity period as recommended by ICAO or State's regulatory requirement, or any validity period as confirmed by the ANSP, with proper planning and scheduling of flight inspection tasks;

(b) Survey or assist to survey the reference point(s) for Global Navigation Satellite System (GNSS) for precision flight inspection on ILS;

(c) Obtain all the necessary permits to fly over areas for its flight inspection;

(d) Closely coordinate with ATC and ground technical personnel to prepare and conduct flight inspection including the provision of flight profiles for ATC assessment;

(e) Implement Safety Management System (SMS) as appropriate to deliver safe flight inspection services;

(f) Keep good archived records of flight inspection results of the equipment / system being inspected and provide advice if there was any anomaly trend or result observed;

(g) Feedback to the ANSP on overall flight inspection arrangement, discuss and assist to resolve problems encountered; and

(h) Desirable to have Crew Resource Management (CRM) to clearly define the roles and responsibilities of each crew member and to establish close collaboration among the crew members.

2.1.2.3 Crew Resource Management (CRM) System

Crew Resource Management (CRM) and Crew Coordination Concept (CCC) define how crews are to work together and the roles and responsibilities of each crew member. It clearly describes the communications involved in executing tasks and should be reinforced by Standard Operating Procedures (SOPs) and checklists. The CRM system, however, does not only define the cooperation among cockpit members, but also should encompass procedures and communication between cockpit and cabin, and it should define the interface between the flight crew and the rest of the organisation, like tasking / scheduling, management, maintenance, etc. This holistic approach in CRM is of great importance to create a working environment that takes into account all requirements to accomplish the organization's mission profile safely and reliably. It effectively translates into a Team Resource Management (TRM).

2.1.3 Roles and Responsibilities of the Flight Inspector

A flight inspector is the person who performs checking on equipment / system status. He / she must be proficient and have a good understanding on the characteristics of various equipment / systems to be flight inspected as well as familiarise himself / herself with relevant procedures to perform flight inspection on that equipment / system.

2.1.3.1 Roles

(a) Contribute in early planning of the flight inspection;

(b) Coordinator between ANSP and the flight inspection service provider;

(c) Perform equipment checking in flight inspection and alert ANSP in real time of any out-of-tolerance conditions or anomaly observed during the flight inspection;

(d) Assist ANSP to identify and analyse any anomaly / adverse trends observed; and

(e) Prepare flight inspection records and reports.

2.1.3.2 Responsibilities

(a) Provide advice to ANSP in planning the flight inspection tasks;

(b) Assist in preparing flight inspection procedures for checking a specific equipment / system;

(c) Coordinate with the rest of flight inspection team (e.g. pilots) for ad-hoc and flexible arrangement of flight inspection procedures (e.g. re-check on a specific run);

(d) Observe the measured results of flight inspection and checks against the relevant tolerance limits;

(e) Keep records of the measurement results and notifies ANSP for any trend/anomaly observed;

(f) Assist ANSP from the flight inspection perspective for the rectification on any anomaly observed; and

(g) Coordinate any real time changes to the flight inspection schedule due to unforeseen circumstances such as inclement weather, aircraft or aircrew problem.

2.1.4 Roles and Responsibilities of ANSP

The ANSP is ultimately responsible for management of the flight inspection. It is therefore vital that ANSP takes an active role throughout the flight inspection.

2.1.4.1 Roles

(a) Types of ANSP Personnel

(i) Ground technical personnel maintaining navigational and landing aids, surveillance radars, airfield lighting and PAPIs, etc.; and

(ii) Air Traffic Controllers – En-route, Approach and Tower.

2.1.4.2 Responsibilities

(a) Ensure that all systems and facilities to be flight inspected are operational and in a condition suitable for flight inspection on the scheduled dates;

(b) Ensure all systems and facilities are regularly flight inspected, complying with the State's regulatory requirement on the periodicity of flight inspection;

(c) Provide an annual draft schedule of systems and facilities to be flight inspected to the flight inspection service provider to facilitate early planning;

(d) Assist in obtaining security clearance for flight inspection crew to access aircraft;

(e) Provide necessary geographical information of systems & facilities under flight inspection, for example latitude and longitude co-ordinates of all navigation facilities;

(f) Provide authorization for flight inspection aircraft to fly below established minimum altitudes, together with all other necessary air traffic authorizations to accomplish the flight inspection;

(g) Provide qualified staff to be present during flight inspection;

(h) Coordinate flight inspection briefing and debriefing;

(i) Review flight inspection profiles with ATC and arrange discussion with FISP for any clarification, if required;

(j) Ensure FISP obtain necessary permits to fly over areas for the planned flight inspection;

(k) Issue necessary NOTAMs for flight inspection;

(l) Review flight inspection reports;

(m) Publish addition or / and amendments to AIP regarding systems / facilities after flight inspection;

(n) Make arrangement for flight inspection crew to call ATC before the start of each sortie for co-ordination purposes;

(o) ATC to facilitate flight inspection and accord it some priority, whenever possible; and

(p) ATC to be conversant with flight inspection profiles.

2.2 FLIGHT INSPECTION COORDINATION AND PREPARATION

2.2.1 Identification of Stakeholders

The smooth conduct of flight inspection requires concerted efforts from all key stakeholders. Subject to the organization structure in the States, an example list of stakeholders related to flight inspection is provided below for reference:

2.2.1.1 Flight Inspection Service Provider (FISP)

(a) FISP plays a vital role in flight inspection and is expected to be conversant with the relevant ICAO and local standards and requirements for fight inspection of various CNS equipment. FISP is also expected to be familiar with the flight profiles to be conducted and local airport / airspace environment in order to perform flight inspection in an efficient and effective manner. FISP should also be familiar with details of permits / approvals required for flying in airspace to ensure a successful and effective flight inspection.

(b) The flight inspection team deployed by the FISP normally consists of three types of staff, namely pilots, flight inspectors and aircraft engineers.

(i) Pilots – mainly communicate with air traffic controllers to perform flight inspection profiles

(ii) Flight Inspector – mainly coordinate with ground maintenance personnel or systems supplier engineer to take, report and calibrate measurement reading to ensure the equipment under inspection performs within the relevant tolerance limits.

(iii) Aircraft Engineer – support staff to deal with daily maintenance and problems encountered on the flight inspection aircraft, which would normally have been deployed at a far distance from the FISP's main base.

2.2.1.2 ANSP - Air Traffic Controller

(a) States may consider, as far as practicable, to assign dedicated air traffic controller(s) in handling the flight inspection aircraft, in which the flight path might cross multiple sectors and affect normal traffic patterns. Experienced air traffic controllers could efficiently reduce the lead time to conduct flight inspection, while keeping the impact to normal traffic to a minimum.

(b) Subject to different airport and airspace, temporary holding of ground and / or air traffic might be required to allow the flight inspection aircraft to conduct dedicated profiles unaffected.

(c) Air traffic controller handling flight inspection aircraft has to work closely with the flight inspection pilot and keep a very close eye on the aircraft position to keep it clear from normal traffic.

2.2.1.3 Aerodrome Operator

(a) Local aerodrome operator plays an important role in providing necessary logistics support to the flight inspection team, for example in the facilitation of access to airport restricted area, facilitate the conduct of flight profiles on ground or assist in handling the shipment of spare parts to address technical faults encountered by the flight inspection aircraft.

2.2.1.4 ANSP - Ground Maintenance Personnel

(a) The ground maintenance personnel are responsible for equipment maintenance and adjustment during the flight inspection. They have to work closely with the flight inspector to ensure the measured reading is within tolerance limit and ensure the equipment is safe for operational use. Prior to the flight inspection, the ground maintenance personnel shall also ensure the equipment is operational and in a condition suitable for flight inspection.

2.2.1.5 Other Supporting Personnel

(a) To facilitate daily flight inspection mission, there might be logistics support required for the flight and ground crews of the flight inspection team to travel between airport and their accommodation place. Immigration, Customs and Exercise clearance support might also be required to facilitate smooth operation of flight inspection activities.

2.2.1.6 Military, if applicable

(a) The military shall be informed of the civilian flight inspection schedule to ensure military flights and civilian flight inspection aircraft routes are de-conflicted. The civilian flight inspection aircraft should take note of the military no fly zones.

2.2.2 Communication with Stakeholders

2.2.2.1 A thorough understanding of the details of flight inspection arrangements is crucial to the successful completion of a flight inspection. All stakeholders should know their roles and duties to render the best support to the flight inspection activities.

2.2.2.2 To facilitate clear communication among stakeholders, ANSP could consider preparing a comprehensive but concise daily programme for sharing among all stakeholders. The daily programme would typically include information on equipment / facility to be inspected, estimated start and end time, parties involved and their roles, useful contacts, etc. (see sample at Attachment A to this chapter).

2.2.2.3 In addition, the ANSP could also consider preparing a detailed flight inspection check sheet for each equipment / facility to document the planned flight inspection profiles to be conducted (preferably with diagrams for easy visualisation) and estimated duration for each run. This check sheet could greatly facilitate air traffic controllers and airport stakeholders to assess any potential impact to airport / airspace operations and to aid communication during the flight inspection (see sample at Attachment B to this chapter). Appropriate NOTAM should also be issued to ensure airlines and pilots are kept informed of the flight inspection schedule and time.

2.2.2.4 Before the commencement of each round of flight inspection, an in-briefing involving all key stakeholders is recommended to ensure all are familiar with their roles and responsibilities in supporting the daily flight inspection as well as any issues requiring special attention. This also allows all stakeholders to exchange comments about the daily arrangement, for instance the flight profiles sequence, and helps to spot early issues that would potentially hinder normal ATC operations and flight inspection.

2.2.2.5 Contingency plan, including backup flight inspection date(s) due to unexpected ad-hoc event such as inclement weather or technical fault, could also be discussed with key stakeholders during the in-briefing.

2.2.2.6 During the flight inspection, it is essential that the ground maintenance personnel maintains direct communication with the on-board flight inspector so that any required adjustment of ground facilities or any recheck can be done expeditiously.

2.2.2.7 During the flight inspection period, daily de-briefing among flight inspection crews, ANSP, ATC and ground maintenance personnel would allow quick feedback on any issues encountered during the flight inspection so as to make timely fine-tuning when necessary for the subsequent flight inspection. This allows individual stakeholder to make adjustment / enhancement arrangement promptly such as issuance / cancellation of NOTAM, co-ordination / cancellation of runway closures, etc.

2.2.2.8 After the completion of each round of flight inspection, a de-briefing involving all stakeholders would help all to strive for continuous improvements on overall flight inspection arrangement, with parties sharing their views and suggestions as well as to share results and resulting actions of the flight inspection.

2.2.3 Consideration in the Planning and Scheduling of Flight Inspection

Flight inspection, depending on the exact flight profiles to be conducted, often causes some degrees of disruption to normal airport and airspace operations, especially at busy international airports during peak traffic hours. When planning and scheduling flight inspections, a number of key factors have to be considered so as to minimise potential interruptions to normal operations, for example:-

2.2.3.1 Traffic Volume

(a) During day time when normal traffic is usually at its peak, the coordination of flight inspection by air traffic controllers will be complex and with great challenges which often results in undesirable disruption to normal air traffic. Hence, for busy airports, there is a trend to advance the flight inspection time to dawn or even earlier so as to avoid the busy day time traffic.

(b) Some flight inspection profiles may require day-light conditions to perform. When scheduling the flight inspection, one possible way to take advantage of less busy early hours would be to perform those flight profiles that do not require day-light condition first, followed by those requiring day-light conditions. As the time of flight inspection is dependent on time of peak traffic volume, close co-ordination and early inputs from ATC and slot planner from the airport operator in the planning would be beneficial.

2.2.3.2 Holiday and Peak Travel Season

(a) Long holidays and travel peak seasons would significantly increase the air traffic volume. In some ANSPs, there may also be a period of time in which equipment configuration or change is not allowed as this supports the heavy traffic in long holiday and peak season. Therefore, when planning and scheduling flight inspection programs, such long holiday and travelling peak seasons should be avoided as far as practicable.

2.2.3.3 Seasonal Weather Condition

(a) In some States, there might be seasonal strong winds, typhoons or severe weather conditions in some parts of the year. Heavy rainfall, lightning and other severe weather conditions may impact or delay flight inspection activities. As such, the fight inspection program should be scheduled to avoid bad weather seasons as far as practicable.

2.2.3.4 Major Military Flying Exercises

(a) Planning of flight inspection should avoid disruption with a period of major military flying exercises. This is because during the latter, many forbidden flying areas / zones may be activated and such activations could affect the normal flight inspection.

2.2.3.5 Types of Flight Inspections

(a) Depending on type of flight inspections, some of them, such as some ILS commissioning checks, procedure validation, etc., may have to be carried out in the daytime with suitable visual conditions.

2.2.3.6 Contingency Arrangement

(a) Back-up/contingency dates should be planned to cater for any unplanned cancellation or effect on flight inspection activities.

(b) The back-up/contingency flight inspection date(s) could be inserted as buffer date(s) in between the planned flight inspection activities, or after all the planned flight inspection activities as an extended arrangement.

2.3 FLIGHT INSPECTION AT NIGHT

Flight inspection operations at night are becoming more popular and may inevitably be required at large and high traffic density airports so as to minimize potential impact to the normal air traffic flow. The possibility of reduced traffic flow densities at night may allow the necessary inspection profiles to be flown with minimal disruption to ATC. However, the potential risks for the FISP crews for performing such tasks at night need to be properly managed.

To reduce the risk in flight inspection at night, FISP crews should be familiar with the airspace and airport environment including the height of terrain and structures along and close to the flight inspection path. Air traffic controllers have to pay special attention to the altitude and flight path of the flight inspection aircraft to avoid any deviation from the planned safe flight path.

Night operations should be considered as any flight inspection being performed 30 minutes after sunset until 30 minutes before sunrise.

2.3.1 Flight Inspection Aircraft Type

2.3.1.1 The aircraft should be a multi-engine type capable of safe flight within the intended operational envelope with one engine inoperative, fully equipped and instrumented for night and instrument flight operations.

2.3.2 Crew Resource Management (CRM)

2.3.2.1 Flight inspection operations at night present additional risks that must be identified, assessed with necessary mitigations and documented. Night flying operations should only be conducted by experienced pilots that are current and proficient at night flying and who understand well the risks associated with night-time flight inspection.

2.3.2.2 A dual pilot operation should be considered for a normal night flight inspection operation to mitigate against the higher risks involved for night operations.

2.3.3 Night Duty Periods

2.3.3.1 FISPs operate under their own Air Operator's Certificate (AOC) and Flight Time Limitation (FTL) which would normally include duty periods for their specific night operations. Consideration should be given to the

preceding duty period prior to any planned night duty to ensure the crew, including the flight inspector, have enough rest periods before and after the night duties.

2.3.3.2 Limitations should be provided for night duties worked in immediate succession, for example two consecutive nights, with a maximum duty period of 11 hours each.

2.3.3.3 Upon the conduction of a single night duty, or two consecutive night duties, there should be a minimum interval of rest time for the FISP crews before the commencement of the next duty time.

2.3.4 Operational Requirements

2.3.4.1 Where a requirement exists for flight inspection of ILS or other NAVAID installations at night, the following operational requirements should be met.

2.3.4.2 Aircraft Related - In addition to the normal equipment required for a night operation, the following equipment should be functioning normally:

(a) Both aircraft altimeters;

(b) Radar altitude indicators;

(c) Auto-Pilot;

(d) All flight instrument displays;

(e) Up-to-date database for flight inspection equipment map display (If applicable);

(f) Electronic Flight Bag (EFB), if applicable; and

(g) Approach plate holders with adequate lighting.

2.3.4.3 ANSP Related – The following is recommended to be provided by the ANSP prior to any night flight inspection operation:

(a) ATC are able to provide an Instrument Flight Rules (IFR) service;

(b) ANSP should provide a full radar service within the area of operation;

(c) Runway edge, centreline, approach lighting and PAPI's shall be serviceable and operating normally;

(d) Any obstacle lighting shall be operational within the designated area of operation;

(e) The weather conditions for the night inspection must be Visual Meteorological Conditions (VMC) below the 25/10 NM Minimum Sector Altitude (MSA) or Minimum Radar Vector Altitude (MVA) / Radar Lower Safe Altitude (LSALT); and

(f) ATC to provide any aerodrome QNH changes expeditiously.

2.3.4.4 Pilot Related - Prior to the commencement of any night inspection operation, a skyline plot of the obstructions in the approach path must be obtained from the aerodrome operating authority. The pilot should compare the intended inspection runs and adjustments made to the minimum operating altitude as necessary.

2.3.4.5 Where flight crews have not conducted a daylight operation into an aerodrome, then prior to conducting a night inspection task, the crew should first fly the approach in daylight conditions to assess the obstacle clearance within the approach area.

2.3.4.6 Areas surrounding the inspection runs shall be predominantly level, clear of terrain and obstacles.

2.3.4.7 For operations in certain States it may be compulsory for the crew to provide an alternate Aerodrome for recovery, these requirements must be determined prior to commencement of night operations. In addition, holding and alternate requirements always need to be borne in mind.

2.3.4.8 To raise the flight crew situational awareness and to reduce fatigue, the autopilot should be used whenever possible.

2.3.4.9 Flights should be conducted under the IFR.

2.3.4.10 Flight Inspection Profiles - Flight inspection at night should be conducted using the following minimum altitudes:

(a) Level runs, Orbits and Part Orbits should not be conducted below the sector 25NM/10NM MSA or radar LSALT.

(b) Not below SECTOR 25/10 NM MSA or radar LSALT until established on a flight inspection approach run, when established within full-scale deflection of the localiser descent may occur.

2.3.4.11 Localiser (LOC) offset approaches that involve flights more than half scale (5 Dots) indications should be flown during daylight.

2.3.4.12 Where a LOC part orbit altitude needs to be increased for a night operation, a range change may be required to ensure that the localiser coverage area correlates with the published GlidePath (GP) angle.

2.3.4.13 Cat III ILS approaches that include a fly through at 50ft along the runway to ILS Point 'E' should only be flown at night providing the following are met:

(a) Runway centreline lights are serviceable; and

(b) Pilots have conducted the relevant simulator training for such an operation.

An alternate method would be for the aircraft to perform a run along the runway centreline prior or post the inspection.

2.3.4.14 GP approach profiles that involve flight with more than half scale "FLY UP" indications should be flown during daylight e.g. GP lower edge (5 dots Fly Up) runs.

2.3.4.15 GP level runs need to encompass coverage and clearance at a minimum angle of 0.45Θ, however, increasing the height to be at MSA for this measurement will inevitably mean an increase in the start range to achieve this, with the possibility that the GP coverage tolerance may not be met beyond 10NM. As an alternate solution, the GP level run profile could be flown with the addition of the night profile run during daylight and the measurements used as a reference transfer standard between the two profiles.

2.4 EMERGENCY FLIGHT INSPECTION ARRANGEMENT

2.4.1 Types of Flight Inspection

2.4.1.1 The various types and priorities of flight inspection are published within ICAO DOC 8071, Chapter 1 (Para.1.5). The following paragraphs discuss the requirements surrounding special inspections.

2.4.2 Priorities of Flight Inspection

2.4.2.1 If there are multiple flight inspection requests, the use of inspection priorities will determine the tasks to be supported first and make the most effective use of the resources in FISP. The following is an order of priorities that should be considered:

Priority	Type	Description
1	Accident/Incident	Accident or incident investigation requiring immediate response.
2	Restoration	Restore a commissioned facility after an unscheduled outage.
3	Periodic	A regularly scheduled inspection of a commissioned facility.

4	Commissioning	A comprehensive inspection of a newly installed facility.
5	Site Evaluation	An inspection to determine the environmental effects on the performance of a planned navigational aid.

Table 2-1. Flight Inspection Priority

2.4.3 Post-Accident Investigation

2.4.3.1 A flight inspection may be requested following an accident or incident by the investigating authority to verify the NAVAID system performance is satisfactory and able to continue to support the published instrument approach procedures and ANSP operations.

2.4.3.2 For a FISP, this type of inspection should be accorded highest priority and an appropriate response time should be contractually agreed between the ANSP and the service provider.

2.4.3.3 Pre-Flight Requirements – The flight inspector will be required to obtain the following information:

(a) Equipment configuration at the time of the accident i.e. transmitter in operation;

(b) Instrument approach procedures used; and

(c) Any additional information required to support the investigation.

2.4.3.4 The flight inspector will need to coordinate the system configuration with the maintenance personnel and perform as a minimum, an inspection of the facility which may include the instrument procedure used if applicable. It is important to note that no equipment adjustments should be made during this inspection and if required, should be performed in a separate special inspection to facilitate investigation.

2.4.3.5 In the event of an accident or incident, ANSP should do all that is reasonably practicable to ascertain that a NAVAID is operating correctly. For this reason, ANSP should have equipment suitable for making field measurements available.

2.4.4 Post-Incident Investigation

2.4.4.1 Where a runway excursion by an aircraft has occurred and damage has been sustained to a NAVAID, the maintenance authority will determine the repairs required to the facility and whether a ground or flight inspection is required to return the facility back into service. However, the following considerations should be given when determining the need for a flight inspection:

(a) Antenna array replacements that will affect the radiated pattern;

(b) Cable replacements that affect transmission line lengths;

(c) Replacement or re-positioning of an ILS near field monitor if the system does not contain integral course monitoring;

(d) Major repair work to the LOC antenna distribution unit or when the center line phasor has been adjusted;

(e) Adjustment or corrective maintenance on phasing or width controls that results in figures outside the monitor site acceptance figures;

(f) Any work performed on the GP antenna distribution unit;

(g) Adjusts to GP integral monitor probes, cables or monitor combiner unit; or

(h) Damage to ILS critical areas ground in the beam forming areas that need re-grading.

2.4.4.2 In the event of an accident or incident, ANSP should do all that is reasonably practicable to ascertain that the facility is operating correctly. For this reason, all aerodromes should have equipment suitable for making field measurements available.

2.4.5 Flight Inspection Service Providers (FISP)

2.4.5.1 Information regarding FISP may be obtained from the appropriate ICAO Regional Office or online from the International Committee for Airspace Standards and Calibration (ICASC) at http://www.icasc.co [1]

2.4.6 Navigational Aid Performance Reports

2.4.6.1 The reporting of aviation safety occurrences is vital to the prevention of aircraft accidents and contributes to the understanding of where safety risks lie within the aviation system. This information provides an understanding of the safety related issues thus allowing these to be addressed and relevant measures adopted. Safety occurrence reporting by aviation professionals contributes to the prevention of accidents and fundamentally promotes the safety of aviation activities within the organisations that employs them or uses their services.

2.4.6.2 Persons involved in aviation activities should be encouraged to report any safety issue they encountered. State regulations should differentiate between the cases which would require mandatory reporting and those that may be reported after judging it relevant.

2.4.6.3 The obligation of these reporting occurrences would be included within the normal operation of an organisation's SMS. ANSP or airline operator should, through a mandatory reporting system, inform the relevant authority of a particular occurrence and with defined categories that represent a significant risk to aviation safety.

2.4.6.4 Safety management systems are reliant on the collection and analysis of safety related information. Therefore, anything that is perceived by the individuals as having the potential to impact safety should be reported within reasonable time, for example, 72 hours to raise awareness of the occurrence.

2.4.6.5 Organisations SMS may define the format of the occurrence reports to be used by relevant aviation professional. It should include areas to report NAVAID performance or RNAV procedure where relevant. In general, reporting forms need to be user friendly and will not discourage potential reporters to report the occurrences. The aim should be to facilitate the collection of occurrence information as much as practicable from the front-line individuals and allow the appropriate authorities to understand and address the issues from the information provided.

2.4.6.6 The following reporting information requirements should be considered as a minimum, but not limited to, in the determination of NAVAID's performance from both an ATC and Pilots perspective.

(a) Date/Time UTC

(b) Aircraft Call Sign

(c) Airline Operator

(d) Pilot Name

(e) SSR Code

(f) Aircraft Type

(g) Aircraft Flight Phase (Climb, Descent, Level, Approach), IFR/VFR, Radar Vectored, Navigational Aid in use (ILS/VOR/DME/NDB/RNAV)

(h) Description of Occurrence

2.4.6.7 ANSP's and Airline Operators are likely to have their own organisations occurrence report forms to cover the mandated reporting requirements within their SMS. These may not contain the aforementioned information relevant for a pilot reporting an unreliable NAVAID performance. Therefore, additional information may be required for investigation purposes depending on the seriousness of the occurrence. Consultation with the ground technicians will greatly assist an immediate investigation on a system status and possible actions required.

2.4.6.8 For precision approach landing aid systems such as an ILS/DME or GNSS Landing System (GLS), once an occurrence report related to the system is received from a pilot, an ANSP would have to follow up by investigation and discussion with ground technicians and may require the issue of a NOTAM on that facility once it is identified to be faulty and requires maintenance. The ANSP has to ensure a continued safe operation or provide alternative services and procedures resulting from the occurrence.

[1] ICAO DOC 8071 Fifth Edition, 2018

2.5 CONSIDERATIONS ON FLIGHT INSPECTION PERIODICITY DURING PANDEMIC

2.5.1 There might be occasion that the flight inspection could be affected by external factor with global impact, such as the COVID-19 pandemic. With such a huge global impact, cross-country deployment of flight inspection aircraft might become difficult, especially for those States who do not have their own FISP. As such, States should assess and consider the flight inspection periodicity on radio navigation aids to secure continuous service or keep minimum impact to service.

2.5.2 ICAO has published a reference note on the considerations of radio navigation aids flight inspection periodicity during COVID-19 (at Attachment C to this chapter).

Attachment A

Example Flight Inspection Programme

Example Routine Flight Inspection Program

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Remarks
In-briefing at (time)						In-briefing with flight inspection team
	XX VOR OFF (time)	XX VOR F/I (start time)				XX VOR – periodic F/I after annual maintenance
			XX ILS maintenance (off time)	XX Tx 1 F/I (start time) XX Tx 2 F/I (start time)		XX ILS - periodic F/I after annual maintenance
					De-briefing	De-briefing with flight inspection team

Notes for ATC and/or Aerodrome Operator:

- Expected period and end time for VOR and ILS flight inspection
- Runway closure and maintenance requirements

Attachment B

Example Flight Inspection Profiles

VOR/DME Routine Inspection

EXAMPLE VOR/DME INSPECTION PROCEDURES LIST					Profile Version
Facility ID			[Facility ID]	Routine Inspection	
Target Completion Time (LT)	Run No.	Flight Procedure	Procedure Description	Facility Transmitter Number	Items To Be Inspected
xxxx-xxxx		Radial xxx°	xxNM-xxNM, QNH xxxxFT	VOR/DME No.1	e.g. Reference Radial/Alignment Check
		Radial xxx°	xxNM-xxNM, QNH xxxxFT	VOR/DME No.2	e.g. Reference Radial/Alignment Check
		Radial xxx°	xxNM-xxNM, QNH xxxxFT	VOR/DME No.1 Only	e.g. VOR Monitor Alarm Check
		Radial xxx°	xxNM-xxNM, QNH xxxxFT		
		Radial xxx°	xxNM-xxNM, QNH xxxxFT	VOR/DME No.1	e.g. VOR Monitor Alarm Normal
		Orbiting (C.C.W. / C.W.)	Radius: xxNM, QNH xxxxFT	VOR/DME No.1	Mean Alignment Error, Bends, Roughness, DME Range Error
		Orbiting (C.C.W. / C.W.)	Radius: xxNM, QNH xxxxFT	VOR/DME No.2	Mean Alignment Error, Bends, Roughness, DME Range Error

Routine Inspection (ILS Tx1)

EXAMPLE ILS INSPECTION PROCEDURES LIST						Profile Version
Runway		ILS Name	ID	ILS Identification	Routine Inspection	
Target Completion Time (LT)	Run No.	Flight Procedure	Procedure Description		Facility Transmitter Number	Items To Be Inspected
xxxx-xxxx		e.g. Threshold Parking	Runway		LOC No.1&2	e.g. Monitor Alarm Check
xxxx-xxxx		e.g. Level Run	xxNM-xxNM QNH xxxxFT		GP No.1	e.g. Width (including alarm), Symmetry SBP, etc.
xxxx-xxxx		e.g. Level Arc	xxNM, +xx°/-xx°, QNH xxxxFT		LOC No.1	e.g. Width (including alarm), Symmetry, Clearance, etc.
xxxx-xxxx		e.g. Approach with low pass	Initial From xxNM and QNH xxxxFT		DME No.1; LOC/GP No.1	e.g. DME and Runway Lighting, Path Angle, Datum, Mod Sum, Structure, etc.

Routine Inspection (ILS Tx2)

EXAMPLE ILS INSPECTION PROCEDURES LIST						Profile Version
Runway		ILS Name	ID	ILS Identification	Routine Inspection	
Target Completion Time (LT)	Run No.	Flight Procedure	Procedure Description		Facility Transmitter Number	Items To Be Inspected
xxxx-xxxx		e.g. Level Run	xxNM-xxNM QNH xxxxFT		GP No.2	e.g. Width (including alarm), Symmetry SBP, etc.
xxxx-xxxx		e.g. Level Arc	xxNM, +xx°/-xx°, QNH xxxxFT		LOC No.2	e.g. Width (including alarm), Symmetry, Clearance, etc.
xxxx-xxxx		e.g. Approach with low pass	Initial From xxNM and QNH xxxxFT		DME No.2; LOC/GP No.2	e.g. DME and Runway Lighting, Path Angle, Datum, Mod Sum, Structure, etc.

Remarks:

- Any protection to ILS sensitive area should be applied

Attachment C

Flight Inspection Periodicity Considerations for Radio Navigation Aids during the COVID-19 Pandemic and Related Recovery Phase

1. Introduction

1.1. The present note discusses issues related to flight inspection that could arise during the COVID-19 pandemic and during the recovery phase, with particular regard to periodicity. The main purpose of the document is to ensure that flight inspection will be able to maintain safe operation of navigation aids during the pandemic and will not be on the critical path to aviation recovery after the pandemic.

1.2. To this end the document stresses the need to maintain regular ground and flight checks of navaids to ensure that they are available during recovery (delaying implementation of new facilities if necessary). It provides information on flight inspection experiences and best practice currently adopted in several ICAO States, including recommendations on how to deal with periodicity intervals when delays are experienced.

2. ICAO Requirements on Flight Inspection Periodicity

2.1. The fundamental ICAO provision addressing flight inspection in general is the Standard in Annex 10, Volume I, Chapter 2, 2.2.1 (reproduced in Appendix).

2.2. Guidance on flight inspection, including periodicity, is given in the ICAO *Manual on Testing of Radio Navigation Aids* (Doc 8071). The general aspects of periodicity requirements are addressed in section 1.15 of the document (reproduced in Appendix), whereas *suggested* **[1]** periodicities for specific navigation aids are given in the chapters corresponding to each aid. States may have determined their periodicity requirements based on local circumstances and as such the recovery should consider these periodicities.

3. Relationship between Ground Testing and Flight Inspection

3.1. This document focuses on flight inspection periodicity. However, Doc 8071 also specifies a number of ground tests with an associated periodicity. Normal practice is to ensure that a navigation facility passes all of its ground tests prior to conducting a flight inspection. Local maintenance staff normally accomplish this. This document assumes that such ground testing can be carried out as required and in accordance with the local COVID-related health precautions. Some of the measures discussed herein can also be applied to ground maintenance staff. The document focuses on flight inspection due to its often international dimension (cross-border operations).

4. Flight Inspection Practices during the Pandemic

4.1. The ICAO Secretariat and EUROCONTROL have conducted an informal survey of flight inspection practices during the pandemic in twenty-seven States.

4.2. The survey results show that the majority of States surveyed are maintaining a regular or near-regular flight inspection schedule during the pandemic. This is consistent with the general recognition of ATC as an essential public service and the related need for reliable system performance of radio navigation aids. However, it should also be noted that the majority of the responses came from States that operate their own flight inspection aircraft. So the survey may not fully reflect the situation in States where issues may exist due to delays or suspended flight inspection operations, especially if they rely on cross-border flights by flight inspection providers (see below).

5. Special Measures

5.1. In order to sustain the flight inspection schedule notwithstanding the pandemic-related difficulties, the majority of the States surveyed have adopted special health safety procedures and operational measures, as discussed below.

6. Health Safety Procedures

6.1. Some or all of the following health safety procedures have been put in place:

(a) daily sanitization of aircraft**[2]** and equipment;

(b) daily supply of personal protection devices to crew, with detailed instructions on usage;

(c) flight inspection crew segregation from ground support personnel (ground maintenance, dispatch, refuel etc);

(d) flight inspection crew segregation from engineering personnel responsible for the navaids under test (telephone coordination only);

(e) segregation between the flight inspection crews themselves (fixed crew staffing); and

(f) implementation of alternate on/off crew rotation rosters taking into account potential incubation period.

7. Operational Measures

7.1. While flight inspection operations have been to some extent facilitated by the low air traffic levels currently prevailing, overall significant operational restrictions are being experienced, calling for special measures to mitigate them.

7.2. A common approach adopted for flight inspection operations during pandemic is to keep individual missions within a single day, returning to base at the end of the day and thus avoiding overnight stays at the destination.

7.3. The impact of the associated reduction in efficiency could be mitigated by prioritizing regular flight inspection missions over new implementation projects (new facilities and procedures).

7.4. Furthermore, among regular missions, those addressing facilities that are approaching the flight inspection due date, particularly in the case of ILS Category III facilities, should be prioritized.

7.5. In some cases however, reductions in aerodrome operating hours may limit the number of working hours available in a day. In such cases and in other cases when overnight stays are necessary (e.g. to avoid exceeding flight duty time limitations), particular care should be given to assessing the chosen accommodation to ensure compliance with pandemic sanitation provisions and minimize the need for external contacts.

8. Specific Issues with Cross Border Flights

8.1. In some cases, in which flight inspection services are supported by cross border flights (international flight service operations), a number of specific issues have been encountered:

(a) requirements for special authorization to access aerodromes that would otherwise be closed to all traffic;

(b) requirements for special authorization for crew access to country;

(c) requirements for quarantine on crew arrival to destination and return to base;

(d) difficulties in ensuring avoidance of contact between crew and ground personnel at destination (eg due to custom/immigration controls); and

(e) suspension of ground maintenance activities.

8.2. These issues were largely unexpected, due to the situation being effectively unprecedented, and were not taken into account in the original inspection schedules. They have required ad-hoc adjustments, negotiated bilaterally on a case-by-case basis by the entities involved. This has typically led to scheduling delays. However, notwithstanding the delays, cross border flights have remained largely feasible, if less efficient, thanks to the commitment of all the parties to the flight inspection requirements.

8.3. In the process, the need for international recognition in pandemic situations of the special status and needs of flight inspection as a key element of the safety-critical air navigation infrastructure has been

highlighted. Future work by ICAO will address the development of guidance to States on facilitating cross-border flight inspection operations in pandemic situations, including development of an advisory health safety protocol to minimize interaction between crew and ground personnel.

9. Dealing with Potential Periodicity Issues during and after the Pandemic

9.1. The informal survey results suggest that in principle flight inspection should be feasible even in COVID-19 times, possibly with some restrictions requiring prioritization/rearranging of schedule as discussed above.

9.2. As a result, periodicity of flight inspection should not be affected substantially, and it should be possible to limit any potential deviations from the nominal intervals to within the time window of extension mentioned in Doc 8071, 1.15.15. While Doc 8071 makes no recommendations on the length of such time windows, the extension window needs to be a reasonable fraction of the nominal interval. For example, some States use a maximum delay of 1 month for nominal inspection periodicities of 6 months.

9.3. In cases in which nominal periodicity cannot be maintained and the appropriate extension time window is exceeded (e.g. because of initial set-up issues with cross-border operations, as discussed above), Doc 8071, 1.15.15 offers a choice of actions that may be considered:

(a) allowing for further extension time, after engineering evaluation and/or ground maintenance reinforcement;

(b) downgrading of ILS (Category III down to Category I or II); and

(c) temporarily removing the navigation aid from service.

9.4. In choosing among those actions, the responsible entities should take into account the exceptionality of the current situation, in which aviation has suffered an unprecedented setback and is facing what can be expected to be a very difficult recovery phase. In this context, the navigation infrastructure must remain operational both to support the reduced level of traffic during containment measures (including flights meeting critical pandemic-related needs, such as delivery of medical supplies) and to facilitate the resumption of regular flight operations. Therefore, in cases where timely flight inspection cannot be ensured, the preferred method for maintaining safe signals in space is to either take advantage of the (short) periodicity extension window, or, if a longer extension is required, to grant an extension of periodicity intervals in line with the principles described in Doc 8071. Furthermore, in cases where flight inspection operations were suspended and periodicity intervals extended, careful planning should ensure that navigation aid availability of service can be ensured to support the recovery.

9.5. At the same time, no compromise on operational safety due to non-standard performance of navigation aids should be accepted. Instead, potential extensions of nominal inspection intervals should be considered only in the presence of appropriate mitigations maintaining nominal safety levels. To this end, the provisions of Doc 8071, 1.15 should be taken into account.

9.6. Doc 8071, 1.15.2 recognizes that the suggested periodicities are given as general guidance and may be modified based on the manufacturer's recommendation or operational experience. Subsequent sections (1.15.4 – 1.15.6) discuss the factors influencing the inspection intervals, including reliability and stability of operation of the equipment, extent of ground monitoring, degree of correlation between ground and flight measurements, changes in the operating environment, manufacturer recommendations, and quality of maintenance. In many cases, modern ground facilities using current technology provide highly stable and reliable signals. A point of particular practical interest in the current context is given in 1.15.6 with the observation that equipment reliability may be adversely affected by too frequently scheduled major maintenance activities, which should therefore be limited to essential needs if extended periodicity is desired.

9.7. Further sections of Doc 8071, (1.15.7 – 1.15.8 and 1.15.10- 1.15.14) discuss the type of technical analysis that would need to be performed to extend nominal ground and flight inspection periodicities in a normal situation. While performing such detailed analysis may be unpractical in a pandemic situation, it should be noted that the most important item to ensure safe facility performance is the verification of the proper functioning of executive monitor shutdown capabilities. Special attention should also be given to site safeguarding, especially if aircraft or other large equipment is being parked near a navigation aid.

9.8. While the guidance in Doc 8071 does not explicitly address the current situation, it does indicate that, in situations in which maintaining nominal flight inspection periodicity is effectively impossible, case-by-case extensions can legitimately be considered on an exceptional basis when the relevant enabling factors are present.

In other words, in the unprecedented situation now being faced by aviation, a reliable system running in a stable configuration with a history of nominal performance, undergoing regular ground checks consistent with manufacturer recommendations which indicate normal functioning, and in the absence of anomaly reports, should normally qualify for an extension of the periodicity interval.

9.9. Special considerations apply to the specific case of Category III ILS. Because of the particularly demanding requirements, rigorous testing is essential. For that reason, during the current pandemic several States are prioritizing flight inspection of Category III ILS. Should it nevertheless occur that flight inspection intervals for a Category III ILS are significantly exceeded, as mentioned above a potential option would be downgrading of the facility from Category III to Category II or Category I.

Note:

[1] It should be noted that "suggested" is the term used in Doc 8071, as opposed to "required". See for instance Doc 8071, 1.5.2: "This document contains suggested schedules for each radio navigation aid, which should be considered (and modified, if necessary), based on the conditions relevant to each State and each site."

[2] See for example EASA "Safety Directive under Article 76(6)(b) of Regulation (EU) No 2018/1139 - SD No.: 2020-01"

Chapter 3

Conducting Flight Inspection

3.1 TYPICAL FLIGHT INSPECTION PROCEDURES

3.1.1 Flight Inspection Procedures Manual

3.1.1.1 Each FISP should provide evidence of operating to a Flight Inspection Procedure Manual. This manual provides assurance to the customer that the necessary compliance checks are being carried out as intended by Doc 8071 and can help with demonstrating compliance. These may vary State to State depending on the regulatory oversight. Some investigation into other areas of aviation within your State can aid with what could be acceptable criteria such as:

(a) Procedure Development (Procedures for Air Navigation Services – Aircraft Operations (PANS-Ops) or Terminal Instrument Procedures (TERPs)); and

(b) Aircraft Recognized Approval Documentation (FAA/EASA, etc.).

3.1.1.2 Doc 8071 provides guidance on typical check methods intended for both Ground and Air for each facility type. The operator should ensure that each listed item is applicable to the inspection type (Commissioning or Categorization, Site, Periodic). The operator or owner of the facility should verify the FISP is adequate to satisfy the required parameter check. For comparison, flight test procedures have been also included in Doc 8071 for guidance.

3.1.1.3 Some flight profiles have been included in this document to assist with comparisons. In some situations, flight validation of the procedure is considered a separate inspection, and therefore it is important to check if the intended procedure covers flying the approach procedure. This may be of benefit in satisfying the procedure revalidation criteria.

3.1.1.4 Clear procedures should be provided to cover any navigational, surveillance or communication equipment that is subject to flight inspections. Inspections should be undertaken with equipment that has calibration traceability and where the FISP can provide clear evidence of the suitability for individual parameter assessment. A Test Accuracy Ratio (TAR) of minimum three or better for each parameter measured can provide a good picture of uncertainties and if the system is fit for purpose.

3.1.1.5 As a provider of service such as DVOR, ILS or other navigational equipment, it is important that the ANSP can demonstrate the facilities are operating to the respective ICAO standard. For this reason, the closer the inspecting receivers represents the level of avionics needed in large aircraft, the less risk of finding inconsistencies between airline approaches and ground check measurements. Hence it is sometimes advantageous if the equipment has international accreditation such as TSO conformance and other relevant aircraft software development standards. This is more important for systems that are directly used for the purpose of Air Navigation verification. The degree of compliance is less for items used as a surveillance tool.

3.1.2 Instrument Landing System (ILS)

3.1.2.1 Key requirements:

(a) Antenna should be calibrated for field strength through the frequency range and different orientations. This should also include frequency response and polar patterns. This data should be available for verification.

(b) The antenna should have TSO compliance for IFR and comply with the local airworthy certification. Location and installation of the antenna should be in accordance with the following:

(i) Recordings should show minimum propeller modulation.

(ii) Aircraft should be fitted with airworthy ILS/DME/Markers equipment approved for IFR flight.

(iii) Kit should be capable of recording the required parameters against the reference system, typically at a rate greater than 5 samples per second.

(iv) The antenna should also have the appropriate TSO rating as required by IFR flight.

(v) The kit should be capable of recording the parameters as outlined in Doc 8071 within the accuracy specified.

3.1.2.2 Typical Flight Profiles for ILS flight checks:

(a) Alignment runs normally commencing as required by the published procedure or 10NM for periodic Inspections.

(b) 6-10NM arc profiles, forty degrees either side of the runway centre-line.

3.1.2.3 Typical parameters to be recorded as applicable for the items being checked:

(a) Receiver course deviation for all systems include Localizer/Glidepath/markers/DME

(b) Aircraft position fixing system deviation

(c) The difference (a) minus (b)

(d) Receiver input signal level

(e) Modulation levels

(f) Frequency spectrum (optional)

3.1.2.4 Careful consideration should be made with regard to the procedures used and the purpose of the check.

3.1.2.5 Depending on the methods employed to ensure monitor integrity, instead of inspecting both the transmitting and monitoring systems of the ILS in every check, some locations may choose to flight inspect the transmitting system once in every two inspections.

3.1.2.6 FISP should be able to provide a table of parameters to assist with comparisons against Doc 8071.

3.1.2.7 An example checklist of commissioning and periodic flight inspection items for ILS is tabulated below for reference.

Check Item	Commission	Periodic
Identification	X	X
Modulation Balance	X	R
Modulation Depth	X	X
Polarisation	X	R
Front Course Alignment	X	X
Course Structure	X	X
Course Sector Width and Symmetry	X	R
Off-course DDM Clearance	X	-
Coverage or Usable Distance	X	-
Monitor Alarm – Front Course Alignment (Position Alarm)	X	X
Monitor Alarm - Course Sector Width (Width Alarms)	X	X
Monitor Alarm - Off-Course DDM Clearance	X (1)	X
Monitor Alarm – Coverage	X	-
Dual Equipment	X	X (3)
Flyability	X	X
Associated Navigation Aids (Navaids)	X	X (2)

LEGEND: R = To action on request
X = To action

- = Not required
(1) = Capture/Clearance Wide Alarm applies only for a dual frequency localizer
(2) = Includes runway visual aids
(3) = Alignment, Modulation Depth and Identification Only

3.1.3 Doppler Very High Frequency Omni-Directional Range (DVOR)

3.1.3.1 Key requirements:

(a) Antenna should be calibrated for field strength, and data should be available for verification. The antenna should have TSO compliance for IFR and comply with the local airworthy certification.

(b) Recordings should show minimum propeller modulation.

(c) Aircraft should be fitted with airworthy DVOR equipment approved for IFR flight.

(d) Kit should be capable of recording the required parameters against the reference system, typically at a rate greater than 5 samples per second.

(e) The antenna should also have the appropriate TSO rating as required by IFR flight.

(f) The kit should be capable of recording the parameters as outlined in Doc 8071, within the accuracy specified.

3.1.3.2 Typical parameters to be recorded as applicable for the items being checked:

(a) Receiver course deviation

(b) Aircraft position fixing system deviation

(c) The difference (a) minus (b)

(d) Receiver input signal level

(e) Modulation levels

(f) Modulation index

3.1.3.3 An example checklist of commissioning and periodic flight inspection items for DVOR is tabulated below for reference.

Check	Commission	Periodic
Identification	X	X
Voice	X	X
9960 Hz/30 Hz Levels	X	X
Vertical Polarisation	X	-
Orbit	X	X
En route Radials	X	R
Terminal Radials and Procedures	X	X (2)
Radial Plan	X	-
Intersections and Changeover Points	X	-
Off-track Coverage	X	-
VOR/DME Sector Altitude Coverage	X	R
High Angle Coverage	X	R
Receiver Checkpoint	X	X
VOR Monitor Checks	X	X
Dual Equipment	X	X
Transmitter Differential	X	-
Standby Power	X	-
Associated Navigation Aids (Navaids)	X	X (1)

LEGEND: R = To action on request
X = To action

- = Not required
(1) = An appearance inspection of the VASI/PAPI is to be included if not otherwise subject to a routine inspection
(2) = Final approach radial(s) only, profile as published

3.1.3.4 Some typical Flight Profiles for DVOR flight inspections:

(a) Arcs at published minimum safe altitude.

(b) Published approach radials at advisory altitudes.

3.1.4 Distance Measuring Equipment (DME)

3.1.4.1 Key requirements:

(a) Antenna should be calibrated for field strength and data should be available for verification. This should consider cables and connectors.

3.1.4.2 A summary of flight test requirements is listed in ICAO Doc 8071. These form a comparison against the FISP's procedure manual. If there are missing parameters, further clarification should be made where in some cases, with acceptable technical and statistical validation, these parameters could be moved to a ground inspection. This is more common on DME facilities. However, this may not be acceptable by your State's regulatory authority and may need to be endorsed by them.

3.1.4.3 Often the DME equipment would be included as part of the ILS or DVOR flight inspections where it is considered an associated facility.

3.1.4.4 Typically, published DME arcs with the appropriate altitude restrictions would be flown, and in accordance with any associated procedures.

3.1.4.5 Doc 8071 provides a list of parameters for reference. It is important to consider both ground check requirements and flight inspection requirements for DME.

3.1.4.6 An example checklist of commissioning and periodic flight inspection items for DME is tabulated below for reference.

Check	Commission	Periodic
Identification	X	X
DME System Distance Accuracy	X	X
Coverage - Terminal Procedures	X	X
Coverage – En-route Radials	X	-
Coverage - Off-track	X (1)	-
Coverage - Steps, Intersections and Changeover Points	X	-
Sector Coverage	X (1)	-
Dual Equipment	X	X (2)
Standby Power	X	-
Associated Navigation Aids (Navaids)	X	X

LEGEND: X = To action
- = Not required
(1) = As specified by Navigation Services
(2) = Identification only for second transponder

3.1.5 Primary Surveillance Radar and Secondary Surveillance Radar (PSR/SSR)

3.1.5.1 The requirements are very dependent on the engineering assessment requirements and expected coverage volume.

3.1.5.2 Some typical considerations are:

(a) Altitude;

(b) Range;

(c) Delay to alert; and

(d) Minimum radar coverage elevation.

3.2 OTHER TYPES OF FLIGHT INSPECTION

3.2.1 Procedure Validation

3.2.1.1 This is detailed in ICAO Doc 9906, Quality Assurance Manual for Flight Procedure Design. Volume 5 – Validation of Instrument Flight Procedures. The ANSP, FISP and Procedure Design Company need to work closely to ensure this aspect is covered off adequately.

3.2.2 VHF equipment, ADS-B, GBAS

3.2.2.1 Flight inspection is typically carried out under request from an appropriately trained Communications/ADS-B or GBAS engineer. The specifics such as location, type of check and flight profiles are determined by a collaborative approach between all involved disciplines. In some cases, flight inspection is used to assist in the validation of models for determining coverage.

3.2.3 Performance-based Navigation – RNAV and RNP

3.2.3.1 At a minimum, the aircraft should have the capability to undertake the desired procedure validation. RNP procedures' validation requirements would normally be specified within the Procedure Design Company specifications. The Aeronautical Design and Development organization should analyze the results to determine containment within the specified criteria. Technical assessment perspective is as follows;

(a) Validation of obstacle survey data is recommended during the flight validation process.

(b) Verification of survey data can be performed by setting ground stations at certain survey points. The ground survey team can check and compare the DGPS signal to the TSO avionic aircraft receiver position.

(c) The survey data may be affected by waypoint, track and bearing error.

(d) The effect of terrain shielding should be taken into consideration.

(e) Verification is often done slightly lower than the published profile to remove altimeter error as often it is advantageous to verify in the worst-case position.

3.3 TYPICAL FLIGHT INSPECTION SYSTEM PERFORMANCE SPECIFICATIONS AND ASSOCIATED TEST ACCURACY RATIOS (TAR)

3.3.1 Test Accuracy Ratios

3.3.1.1 As the results obtained by the flight inspection system could potentially be used to defend a service provider in the event of an incident or accident, the State should clearly specify the standards adopted in the maintenance and calibration of the systems used for flight inspection purposes. To effectively perform calibration of a system, the calibration equipment should be typically five (minimum three) times more accurate than the system equipment. Some considerations should be as follows:

(a) Temperature stability and compensation.

(b) Electromagnetic interference.

(c) Polar Pattern considerations.

(d) Absolute measurements.

(e) Relative measurements.

(f) Aircraft receiver and calibration equipment duplication.

3.3.1.2 The calibration equipment should also undergo regular periodic checking as part of verification against traceable international standards that support the TAR required.

3.3.1.3 A dedicated calibration facility operated by the ANSP or ISO/IEC 17025 approved facility is the preferred means by which to achieve this to ensure a good consistency of standards.

3.3.2 Duplication

3.3.2.1 System duplication is important throughout the calibration process of both the flight inspection equipment and calibration laboratory used to calibrate the systems. Duplication of equipment can very quickly identify system drift and prevent unknowingly using a bad receiver to adjust an air critical system incorrectly.

Chapter 4

Reporting of Flight Inspection Results

4.1 TYPICAL FLIGHT INSPECTION REPORTS

4.1.1 After each daily flight inspection, the flight inspector should prepare the flight inspection report. The formal flight inspection report signed by the responsible captain and flight inspector should be provided after the flight inspection. The contents of flight inspection report typically include the following items:

(a) Location

(b) Identification

(c) Flight inspection date(s)

(d) Facility inspected

(e) Type of inspection

(f) Inspected items

(g) Results

(h) NOTAM

(i) Facility status

(j) Remarks

(k) Aircraft registration number

4.1.2 A sample flight inspection report is provided in Attachment A to this Chapter for reference.

4.2 TYPICAL FLIGHT INSPECTION RECORDS

4.2.1 Flight inspection records and flight inspection data sheet should be provided by flight inspector. The contents of flight inspection record typically comprise of the following items:-

(a) Airport name

(b) Aircraft registration number

(c) Date of inspection

(d) Inspector's name

(e) Flight hours

(f) Facility type and identification

(g) Run numbers

(h) Transmitter number

(i) Flight inspection results of each run

4.2.2 A sample Flight Inspection Report is provided in Attachment B to this Chapter for reference.

Attachment A
Sample Flight Inspection Reports

Sample Flight Inspection Report for ILS/DME

1.LOCATION:				2.RUNWAY NO:		
3.DATE(S) OF INSPECTION:				4.IDENTIFICATION:		
5.TYPE OF		SITE EVALUATION		PERIODIC		SPECIAL
INSPECTION		COMMISSIONING		SURVEILLANCE		INCOMPLETE
6.FACILITY		LOCALIZER		GLIDE SLOPE		DME
INSPECTED		LIGHTING SYSTEM		7. AIRCRAFT NO:		
8.CATELOGY:				9.FREQUENCY:		
10.COMMISSIONED COURSE WIDTH:				11.COMMISSIONED PATH ANGLE:		

12.LOCALIZER

FLIGHT INSPECTION ITEMS	TX1		TX2	
	INITIAL	FINAL	INITIAL	FINAL
IDENTIFICATION				
MODULATION				
ALIGNMENT				
COURSE STRUCTURE—Z1/RNG				
COURSE STRUCTURE—Z2/RNG				
COURSE STRUCTURE—Z3/RNG				
COURSE STRUCTURE—Z4/RNG				
COURSE STRUCTURE—Z5/RNG				
VERTICAL POLARIZATION/RNG				
WIDTH/SYMMETRY				
MEAN WIDTH(HALF)/SYMMETRY				
CLEARANCE 90/DEG				
CLEARANCE 150/DEG				
MOD.BALANCE(COS/CLR)				
Z5 ROLL OUT RESULT:				

USABLE DISTANCE				
MONITOR				
WIDTH ALARM(NARROW)/SYM				
WIDTH ALARM(WIDE)/SYM				
CLEARANCE 90 (WIDE ALARM)				
CLEARANCE 150(WIDE ALARM)				
ALIGNMENT ALARM(+)				
ALIGNMENT ALARM(-)				

13.GLIDE SLOPE				
FLIGHT INSPECTION ITEMS	TX1		TX2	
	INITIAL	FINAL	INITIAL	FINAL
ANGLE /REFERENCE DATUM HEIGHT				
MODULATION				

PILOT IN CHARGE:	FLIGHT INSPECTOR:	AIRCRAFT NUMBER:

Sample Flight Inspection Report for Runway Approach Lights and PAPI

1.LOCATION:							2.RUNWAY NO:				
3.DATE/DATES OF INSPECTION:											
4.TYPE OF INSPECTION		SITE EVALUATION		COMMISSIONING		PERIODIC		SURVEILLANCE		SPECIAL	INCOMPLETE
5.FACILITY INSPECTED		PAPI				RUNWAY LIGHTS				APPROACH LIGHTS	
6.COMMISSIONED PAPI ANGLES		NO.1		NO.2		NO.3		NO.4		PATH ANGLE	
	LEFT										
	RIGHT										
7.PAPI INSPECTION RESULTS											
ACTUAL PAPI ANGLES		NO.1		NO.2		NO.3		NO.4		PATH ANGLE	
	LEFT										
	RIGHT										
ITEMS CHECKED		SAT		UNSAT		ITEMS CHECKED				SAT	UNSAT
COVERAGE ANGLE						VISIBLE DISTANCE					
INTENSITY LEVEL						INTENSITY COINCIDENCE					
NO. OF INOPERATIVE LIGHTS						COINCIDENCE WITH ILS					
8.APPROACH LIGHTS RESULTS INSPECTION RESULTS											
ITEMS CHECKED		SAT		UNSAT		ITEMS CHECKED				SAT	UNSAT
LAMP ALINMENT						VISIBLE DISTANCE					
INTENSITY LEVEL						INTENSITY COINCIDENCE					
NO. OF INOPERATIVE LIGHTS						LIGHTS CATEGORY					
9.RUNWAY LIGHTS INSPECTION RESULTS											
ITEMS CHECKED		SAT		UNSAT		ITEMS CHECKED				SAT	UNSAT
LAMP ALINMENT						VISIBLE DISTANCE					
INTENSITY LEVEL						NO. OF INOPERATIVE LIGHTS					
RUNWAY END LIGHTS						LANDING ZONE LIGHTS					

10.FACILITY STATUS	PAPI	RUNWAY LIGHTS	APPROACH LIGHTS	11.NOTAM's:
UNRESTRICTED				
RESTRICTED				
UNUSABLE				

12.REMARKS:		
PILOT IN CHARGE'S SIGNATURE:	FLIGHT INSPECTOR'S SIGNATURE:	AIRCRAFT NO:

Sample Flight Inspection Report for DVOR/DME

1.LOCATION:						2.IDENTIFICATION:					
3.FLIGHT INSPECTION DATE(S):				4.FACILITY INSPECTED			VOR		DME		
5.TYPE OF INSPECTION		SITE EVALUATION		PERIODIC		SPECIAL					
		COMMISSIONING		SURVEILLANCE		INCOMPLETE					

6.ORBIT RESULTS

NO.	TX NO.	FLIGHT LEVEL(MSL)	ORBIT RADIUS(NM)	MEAN BEARING ERROR	MEAN RANGE ERROR
1	**1**				
2	**2**				

7.RADIAL RESULTS

RADIAL USE								
AZIMUTH								
TX NO.								
MSL ALTITUDE								
DISTANCE FROM								
DISTANCE TO								
ALIGNMENT ERROR								
MAX BEND/RANGE								
ROUGHNESS/RANGE								
POLARIZATION								
TRANSMITTER DIFF								
MOD30HZ AM								
MOD30HZ FM								
MOD9960HZ								
MINIMUM SS								

DME RANGE ERROR								
INTERFERENCE								

8.MONITORS

TX NO.	REFERENCE RADIAL	MSL	RANGE	ALIGNMENT	ALARM+	ALARM-

9.ORBIT BEARING ERROR (TX NO.1)

9.ORBIT BEARING ERROR (TX NO.2)

10.GROUND RECEIVER CHECK POINT

GROUND CHECK POINT	TX NO.	BEARING READING	RANGE READING

11.GENERAL	TX1		TX2	
	SAT	UNSAT	SAT	UNSAT
STANDBY POWER				
VOICE				
VOR IDENTIFICATION				
DME IDENTIFICATION				

DME ACCURACY				
DME COVERAGE				

12.FACILITY STATUS			13.NOTAM's:
STATUS	VOR	DME	
UNRESTRICTED			
RESTRICTED			
UNUSABLE			

14.REMARKS:		
PILOT IN CHARGE'S SIGNATURE:	FLIGHT INSPECTOR'S SIGNATURE:	AIRCRAFT NO:

Attachment B
Sample Flight Inspection Records

Sample Flight Inspection Record

Flight Inspection Record / Log Sheet					
Airport Name:		Aircraft Registration Number:		Date of Inspection:	
Flight Hours:		Total Number of Run:		Inspector Name:	
Facility Type:		Identification:		Frequency:	
Temperature:		Air Pressure:			
Run Number	**Transmitter**	**Profile**	**Result Summary**		**Finding**

Appendix 1

1. USEFUL REFERENCE

- ICASC - Document on Standards and Recommended Practises for Flight Inspection & Flight Validation Organisations
  http://www.icasc.co/sites/faa/uploads/documents/Library/ICASC/ICASC_SARPs_FI_FV_v14_11102018_final101.pdf

- ICASC Recommended Flight Inspection & Flight Validation Contract Annex
  http://www.icasc.co/sites/faa/uploads/documents/Library/ICASC/ICASC_FIS_Contract__Annex_v0_2_26_05_2016_final101.pdf

- Reference note from ICAO on the considerations of radio navigation aids flight inspection periodicity during COVID-19
  https://www.icao.int/safety/COVID-19OPS/Pages/ANS.aspx

Appendix 2

1. Use of Emerging Technology to Supplement Flight Inspection

1.1. Flight navigation systems are essential in the world where global air traffic growths continuously. These systems enable Air Navigation Service Providers (ANSPs) to ensure that aircraft can reach their destination in due time safely, despite the continuous increase in air traffic density. Indeed, Air Traffic Management (ATM) companies strongly rely on advanced, unfailing and efficient navigation aid equipment in order to accomplish their mission in the best conditions.

1.2. Among the numerous requirements from the International Civil Aviation Organization (ICAO), flight navigation systems must be regularly calibrated, inspected and maintained to ensure that all essential navigation aids for pilots are always working properly. This means that these systems must be tuned and maintained to radiate the correct signals in the airspace, at any time. To achieve this, a combination of ground and air inspections is necessary, like the localizer measurements for CAT III ILS (Instrument Landing System).

1.3. ILS is an essential navigation aid to help pilots land their aircraft in low visibility conditions during IFR (Instrument Flight Rules) flights. In order to maintain the ICAO ILS certification, dynamic measurements need to be performed by the airport operators / ANSPs, their subcontracted flight inspection organizations or government agencies. These companies are always looking to improve and streamline inspection processes to mitigate impacts on airport operations. The regular ILS signal inspection is made in flight, using a manned aircraft. It requires prior coordination and preparation with various stakeholders, together with ground measurements in order to optimize the manned flight inspection.

1.4. Both of the above flight and ground operations have their limitations: the manned aircraft is costly, noisy and environmental unfriendly with large fuel consumption by flight inspection aircraft, while the ground one is limited in terms of reachable distance and height for the measurement antenna. The ground ILS inspections are indeed restrained to the runway threshold, since they are performed using masts that generally don't go higher than around 25 meters, from the ground. This is where the initiative for developing drones or Unmanned Aerial Vehicle (UAV) inspection solution. With improved lifting power, efficiency and reliability, the drone / UAV could perform inspections in the ILS far field as well as ILS elevation profiles and mini approaches with inspection to analyze the ILS signals (course alignment, slope angle, alarms, displacement sensitivity, etc.) and to supplement the ground and manned flight measurements in a more comprehensive mean.

1.5. With the technology of UAV being widely and rapidly developing, more and more flight inspection institutes came into the research on how to utilize UAVs for flight inspection and many practices have been made. The UAVs are normally classified in two groups, the drones, which are smaller, normally with multiple rotors; and Remotely Piloted Aircraft System (RPAS), which are heavier and with fixed wings. Some institutes concentrate on the development of RPAS flight inspection, which is quite similar to the performance of normal flight inspection aircrafts, but cheaper on cost.

1.6. It should be noted that the technology of UAV/RPAS is still emerging. Major issues that still need to be addressed including the integration of UAV/RPAS with other manned civil aviation traffic in unsegregated airspace, while maintaining a similar high level of integrity and reliability that have been developed and matured over the past decades. These integrity requirements, especially those apply to the operations beyond line of sight, would be even more significant when operating in Terminal Airspace, with a mixture of UAV/RPAS operations and regular traffic in densely used airspace. Major challenges in mastering UAV/RPAS autonomous operations (traffic sensing and avoidance), improving system integrity and reliability, as well as establishing a suitable certification framework and process, still need to be addressed. Nowadays, UAV/RPAS are already well positioned to assist Ground and Flight Inspection under a clearly defined and restrained operational environment.

2. Flight Inspection with Drones

2.1. Application of drone inspection allows improvements on ILS inspection operations by dramatically reducing the manned aircraft flight inspection frequency and thus decreasing the overall operational cost for airport operators. Highlights of advantages that could be brought by applying drone in ILS flight inspections are listed below:

(a) Supplement to ILS ground measurements

(b) Excellent repeatability

(c) Cost & time saving

(d) Flexible inspection time

(e) Reducing operational disturbances

(f) Reducing CO_2 and noise emissions

2.2. This major step in ILS maintenance domain for preventive and corrective maintenance is only a beginning. Thanks to the technology advancement, research institutes are going further in developing the next generation ATM systems. In addition to ILS flight inspections, new horizon also arise for drone / UAV inspection on other systems like VOR, DF, PAPI, radars, etc.

2.3. With user-friendly interface, preparing the drone operation could take less than 1 minute. The operator just has to select the airport and the runway from database and then choose the type of the required inspection. Once this is done, all the required data (missions, waypoints, distances, altitudes, etc.) is generated automatically. There is no need to read the procedures to figure out which measurements that are to be made and where to be made. The operation could be created in platform with simple access from the tablet to view and download the details. This database of airports, runways and navigation aids can be expanded and updated with an easy-to-use web interface.

2.4. Once the corresponding operation has been downloaded to the inspection program / application, the operator could launch the mission and monitor the automated procedures. The operator is guided throughout the mission. Each mission takes only a few minutes of flight and could be repeated as many times as needed. Measurements are available and could be viewed in real-time.

2.5. Reports are viewable on-site through the program / application. There is no need to download the measured data to compile the reports. Reports contain all the relevant measurements and parameters same as any report generated from generic flight inspection aircraft, in the form of tables and images. Reports, along with all the measurements, images or videos, are uploaded into a platform for centralized recording, future reference or additional processing.

3. Worldwide Development of Drones to Assist Flight Inspection / Testing

3.1. As in 2019, flight inspection organizations or institutes in Belgium, China, Germany, Italy, Russia, Spain have used drones to assist and provide supplementary tests in flight inspection works. The drones are normally be used to assist testing of navigation equipment signals, since they are not competent for all flight inspection missions with limited performance in speed, service ceiling, endurance, crosswind resistance, payload, etc.

3.2. Belgium

(a) The development of the UAV / drone solution for ILS inspection was started in 2015 and in operation since January 2018 in Belgium and has extended the usage to Geneva (GVA – LSGG) and Zurich (ZRH – LSZH) airports.

3.3. Germany

(a) In early November 2018, a drone specially developed for carrying out ILS measurements was employed at Hannover International Airport in Germany during the commissioning of a new ILS. This entailed generating DDM (Difference of Depth of Modulation) measurement curves above and below the 3° approach path of the new 09R ILS at 1 km distance from the threshold. The measurement flights were monitored not only in the control tower of the Hannover airport, but also at the DFS headquarters in Langen via a drone tracking system. The flights were very successful and form an important impulse for the rapid operational introduction of measurement drones for ground measurements of the numerous Instrument Landing Systems installed at German airports.

4. Flight Inspection with RPAS

4.1. Balancing the factors of performance, cost, operation, maintenance, management, safety, the fixed-wing RPAS with 8-11 meters wing span is better for flight inspection due to its stability in flying, with following example performance for reference.

4.2. Typical performance of RPAS for flight inspection

(a) Wingspan: 8-11 meters

(b) Cruising speed: 100-180 km/h

(c) Max speed: 200-240km/h

(d) Ceiling: 6000m or higher

(e) Runway length for take-off and landing: 300m or longer

(f) Payload for inspection equipment: 50kg or more

(g) Electrical power supply: 2kw or more

(h) Endurance: 5 hours or more after inspection system installed

(i) Communication: C2 or 5G or Data link with bandwidth more than 2M

(j) Flight control: fully pre-programmable

4.3. Typical RPAS flight inspection system configuration

(a) RPAS aircraft

(b) Airborne inspection system including all the receivers, transceivers, camera, position-fixing, communication equipment and antennas, etc.

(c) Vehicle-borne system including control console, communication equipment, differential station, etc.

(d) Container and transportation truck

(e) Control car

(f) Auxiliary equipment and mobile

4.4. Operation considerations of RPAS flight inspection

(a) Fully pre-programmed flight for all inspection profiles including take-off and landing

(b) Signal collection in the air and processing on the ground

(c) Internet Big Data system and Artificial Intelligence (AI) analysis

(d) On-site co-operation with NAVAID maintenance and ATC

(e) Ground transportation from airport to airport

(f) Crew members:1 or 2 inspectors, 3 or 4 maintenances/operators

4.5. Safety management of RPAS flight inspection

(a) Organizations or institutes operating RPAS flight inspection should establish a safety management system (SMS) to ensure flight safety of RPAS. A good experience is to evaluate with the tool named SORA (Specific Operations Risk Assessment).

5. Profiles and Items for RPAS Flight Inspection

5.1. ILS

(a) All the ILS inspection profiles could be flown by RPAS.

(b) All the inspection items including LOC alignment, GP angles, modulations, structures, clearance, width, coverage and all the alarms could be checked by RPAS.

(c) Alignment alarm of LOC should be checked closer to the antenna on the runway or using the approach since it would be difficult to get a stable result on the ground of runway threshold.

5.2. VOR/DME and NDB

(a) RPAS could implement almost all the profiles required for VOR/DME and NDB flight inspection. The only insufficiency is the high flight level en-route signal check limited by RPAS performance.

5.3. PAPI

(a) Many institutes and organizations have attempted to check PAPI with camera-equipped drones. RPAS could do this work better since it could simulate a real approach and get more realistic results. However, camera stability and the ability to zoom during high speed approach would be a challenge to RPAS flight inspection researchers.

5.4. Flyability

(a) The lack of human sensing and judgment in actual cockpit and without assistance from on-board flight instruments, it is difficult to rate the fly-ability for a specific procedure / equipment by RPAS flight inspection. . It is suggested that fly-ability should be assessed by manned aircrafts.

5.5. Flight inspection recordings and plotting

(a) Flight inspection recordings and plotting, together with the inspection reports could be done on ground and transferred to a central data repository, which could then be analyzed by customers and facilitate set-up of a Big Data system for future management and reference.

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.5. MET

METEOROLOGY SUB-GROUP REPORT (WP/13)

3.5.1. All documentation and reports from the Twenty-fourth Meeting of the Meteorology Sub-Group (MET SG/24), 16 to 20 November 2020, and its contributory bodies: Meteorological Requirements Working Group (MET/R WG); Meteorological Information Exchange Working Group (MET/IE WG); and Meteorological Services Working Group (MET/S WG), are available at the ICAO APAC Office website at: www.icao.int/apac > Meetings > Meeting List – 2020. The full report from MET SG/24 is at the following link:

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

MET SG terms of reference and work plan

3.5.2. MET SG proposed updates to its work plan based on outcomes from MET SG/24 discussions as well as minor changes to the MET SG terms of reference document to help ensure the timely availability of MET SG meeting papers.

3.5.3. In view of the above, the meeting adopted the following Decision:

<table>
<tr><td colspan="3">Decision APANPIRG/31/16: Updates to terms of reference and work plan of MET SG</td></tr>
<tr><td colspan="2">What: That, APANPIRG approve the updated terms of reference and work plan document for MET SG at the Appendix A to the Report on Agenda Item 3.5.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To ensure alignment of the work of the MET SG and its contributory bodies.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: MET WGs</td></tr>
</table>

APAC ANP, Volume III

3.5.4. In order to coordinate the development of a proposal for amendment to the APAC ANP, Volume III, to deal with MET-specific content together with, and not in isolation from, other content in Volume III, MET SG proposed that APANPIRG establish a cross-cutting, ANP Volume III Task Force (Draft Conclusion MET SG/24-02: *APAC Regional Air Navigation Plan (ANP), Volume III*, refers).

3.5.5. APANPIRG/31 noted that there had been very limited opportunity prior to the meeting for the AOP, ATM and CNS Sub-Groups to consider the above proposal. The APANPIRG Chair and Secretariat, therefore, suggested that, while it appeared premature to establish a dedicated APANPIRG task force, the MET SG should progress with its development of a proposal for amendment to Volume III to deal with the MET-specific requirements and to continue to coordinate this work, as necessary, with the other Sub-Groups.

Survey of state MET information supporting ATM

3.5.6. MET SG progressed work on a Regional survey on the provision of current and future meteorological information services by States to support air traffic management and, in particular, air traffic flow management, which it will circulate for input from States in early 2021 (Conclusion MET SG/24-03: *Survey of State Meteorological Information Supporting Air Traffic Management*, refers).

APANPIRG air navigation deficiencies

3.5.7. MET SG proposed the removal of air navigation deficiency AP-MET-01 (concerning the provision of aerodrome meteorological observations or reports in Solomon Islands) from the APANPIRG list of air navigation deficiencies (Draft Conclusion MET SG/24-04: *Resolution of Air Navigation Deficiency AP-MET*-01, refers). This is further discussed under Agenda Item 4.

3.5.8. MET SG agreed to further develop its systematic process for the identification and resolution of specific air navigation deficiencies in the field of aeronautical meteorological services (Decision MET SG/24-05: *MET Deficiencies*, refers).

SADIS and WAFS

3.5.9. MET SG reviewed changes to the World Area Forecast System (WAFS), including the introduction of new, improved, higher resolution data sets and the retirement of existing data, which will require the international civil aviation users to implement changes to their Secure Aviation Data Information System (SADIS) systems and software.

3.5.10. In view of the above, the meeting adopted the following Conclusion:

<table>
<tr><td colspan="3">Conclusion APANPIRG/31/17: 0.25 degree WAFS hazard data</td></tr>
<tr><td colspan="2">What: That SADIS user States urgently make the necessary systems changes to integrate the new 0.25 degree WAFS hazard data into their SADIS user systems and software</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To benefit from the new 0.25 degree WAFS data and prepare for the retirement of the existing Turbulence Potential, Icing Potential and 1.25 degree cumulonimbus fields (not before November 2022) and the in-cloud turbulence field</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

3.5.11. In addition, the future introduction (November 2023) of significant WAFS and SADIS upgrades will require further changes by users and, therefore, MET SG will develop appropriate actions to facilitate WAFS and SADIS user States with necessary preparations (Decision MET SG/24-07: *November 2023 WAFS and SADIS Upgrades*, refers).

Volcanic ash information

3.5.12. In response to outcomes from the ICAO APAC volcanic ash exercise, VOLCEX 20/02, conducted in the South Pacific on 17 July 2020, MET SG (and MET/S WG) will support the Informal South Pacific ATS Coordination Group (ISPACG) with a dedicated workshop aimed at minimising the likelihood of disseminating conflicting information in the air traffic system on volcanic ash (Conclusion MET SG/24-08: *Volcanic Ash Information Conflict Reduction*, refers).

IWXXM

3.5.13. Outcomes from the ICAO APAC 2020 *Webinar on the Implementation of the ICAO Meteorological Information Exchange Model (IWXXM)* and *Regional Survey on the Implementation of IWXXM and Extended Air Traffic Services Message Handling System (AMHS)* indicated that only half (or less) of APAC States had implemented, or had planned for, the ICAO Annex 3 standards concerning IWXXM, which became applicable on 5 November 2020.

3.5.14. MET SG will conduct a follow-up, Regional survey to monitor States' progress and help to identify States' needs for additional technical assistance, including an IWXXM-specific seminar or workshop during 2021 (Conclusion MET SG/24-09: *IWXXM Survey and Online Workshop*, refers).

3.5.15. The meeting recalled Conclusion APANPIRG/30/17 and Conclusion APANPIRG/30/18, previously adopted to facilitate the planning and implementation by APAC States of the dissemination of meteorological information in IWXXM GML form. However, in view of the discussion above, and taking into account the need for urgent progress by APAC States to comply with the ICAO Annex 3 standards concerning IWXXM, the meeting adopted the following, updated Conclusion:

Conclusion APANPIRG/31/18: *Implementation of IWXXM*	
What: That, to support the dissemination by States of the required meteorological information in IWXXM GML form, in accordance with Amendment 79 to Annex 3, Member States/Special Administrative Regions, in particular those which host the designated APAC Regional OPMET Centres (ROCs) and Regional OPMET Databanks (RODBs), that have not already done so, urgently complete the necessary steps including the following: a) For the generation and dissemination of required meteorological information in IWXXM GML form to the local ROC to manage the onward dissemination within the Region, use only IWXXM Version 3 (or a later version); b) To support the exchange of IWXXM formatted data, implement the Air Traffic Services Message Handling System (AMHS) with File Transfer Body Part (FTBP) and the Interpersonal Message Heading Extension (IHE) and include support for AMHS message exchange of a maximum size of 4-MB for IWXXM formatted messages with maximum size of 2-MB for FTBP; c) To support the exchange of the required meteorological information in both IWXXM GML form and traditional alphanumeric code (TAC) form, ensure there is adequate capacity in the operational Aeronautical Fixed Service (AFS) links;	Expected impact: ☐ Political / Global ☒ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical

d) When ingesting FTBP messages, as a minimum, utilize appropriate malware and anti-virus precautions; and e) For any requirements States have for further technical assistance to achieve compliance with the Annex 3 requirements for disseminating meteorological information in IWXXM GML form and/or differences that exist between the national regulations or practices and the above Annex 3 provisions, inform ICAO via the appropriate channels.	
Why: a) Amendment 79 to Annex 3 specifies that, applicable 5 November 2020, States shall disseminate specific meteorological information (i.e., METAR/SPECI, TAF, SIGMET, AIRMET and volcanic ash, tropical cyclone and space weather advisory information) in IWXXM GML form; b) ICAO Doc 10003 – *Manual on the Digital Exchange of Aeronautical Meteorological Information*, stipulates that, to meet the requirements of Amendment 79 to Annex 3, only Version 3 of IWXXM formatted data, or later, shall be exchanged on operational networks from 5 November 2020; c) IWXXM GML form is far more verbose than the existing TAC format and, as a result, compression is required. However, to support the exchange of compressed IWXXM files, AMHS links with FTBP and IHE are required; d) In accordance with Annex 3, States shall disseminate both IWXXM and TAC data over the AFS in parallel and, given the significant increase in data volumes, operational links will, therefore, require adequate capacity to support both data sets; and e) The regional and global exchange of the required meteorological information in IWXXM GML form depends on the ROCs and RODBs being capable of exchanging IWXXM formatted messages.	Follow-up: ☒Required from States
When: 16-Dec-20	Status: Adopted by PIRG
Who: ☐ Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

3.5.16. In addition, MET SG will consolidate the IWXXM exchange scheme in APAC (in accordance with the *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*) through Regional OPMET Centres (ROCs) and develop an online register for States to share IWXXM-related information (Conclusion MET SG/24-11: *IWXXM Exchange Approach*, and Conclusion MET SG/24-12: *Development of Online Register of the status of IWXXM Exchange*, refer).

Regional Guidance Material

3.5.17. To provide States with access to required, up to date information pertaining to the SADIS and WIFS, and tropical cyclone and volcanic ash advisory centres (TCACs and VAACs), which is no longer available in the ANP, MET SG will incorporate the relevant, legacy, ANP FASID Tables and Charts into the current APAC regional guidance material (Decision MET SG/24-01: *Updates to legacy FASID Table information*, refers).

3.5.18. In addition, MET SG will progress the development of *APAC use cases and user requirements for System-Wide Information Management (SWIM)-based MET information services supporting Air Traffic Flow Management (ATFM)* (Decision MET SG/24-13: *Development of APAC User Requirements for SWIM-based MET Information Services Supporting ATFM*, refers).

3.5.19. MET SG updated the *APAC Regional SIGMET Guide*, the *Regional OPMET Bulletin Exchange (ROBEX) Handbook* and the *APAC Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management (ATM) Operations* (Decision MET SG/24-14: *Updates to Regional SIGMET Guide*, Decision MET SG/24-15: *Updates to ROBEX Handbook*, and Decision MET SG/24-16: *Updates to Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations*, refer).

3.5.20. MET SG will also develop proposals for consequential amendments to the regional guidance material and the APAC ANP to incorporate changes to the location indicators used for FIRs in Vietnam (Conclusion MET SG/24-19: *Amendments to Regional Guidance to reflect changes to location indicators for Hanoi FIR and Ho Chi Minh FIR*, refers).

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APPENDIX A to the Report on Agenda Item 3.5

METEOROLOGY SUB-GROUP (MET SG)
TERMS OF REFERENCE AND PLAN OF WORK

Editorial Note: Proposed updates endorsed by MET SG/24 shows deleted text using strikeout (~~text to be deleted~~), and added text with grey shading (text to be inserted).

1. Objectives of the MET SG

a) Ensure the continuous and coherent development of the MET parts of the Asia/Pacific Regional Air Navigation Plan (APAC ANP) and other relevant regional documentation in a manner that is harmonized with adjacent regions, consistent with ICAO standards and recommended practices (SARPs), the Global Air Navigation Plan and the Global Aviation Safety Plan and reflects global requirements;

b) Facilitate the implementation of aeronautical meteorological systems and services, as identified in the APAC ANP, Aviation System Block Upgrade (ASBU) priority modules and Asia/Pacific Seamless ~~ATM~~ANS Plan elements, with due observance to the primacy of air safety, regularity and efficiency; and

c) Identify and address specific air navigation deficiencies in the field of aeronautical meteorological (MET) services.

2. Functions of the MET SG:

a) Review MET parts of the APAC ANP, prepare amendment proposals as necessary to reflect updates and changes in the operational and global requirements;

b) Monitor the level of and, as necessary, facilitate the implementation of aeronautical meteorological services to support the effective implementation of ASBU priority modules and the Asia/Pacific Seamless ~~ATM~~ANS Plan elements;

c) Identify air navigation deficiencies in the field of aeronautical meteorology, e.g., through systems performance monitoring) and, where necessary, propose appropriate corrective action and facilitate the development and implementation of action plans by States to resolve identified deficiencies;

d) Review and update the APANPIRG list of air navigation deficiencies in the field of aeronautical meteorology, as necessary, to reflect the current situation;

e) Monitor research and development and trials and demonstrations in the field of aeronautical meteorology and other relevant areas and facilitate the transfer of this information and expertise, as necessary, between States;

f) Make specific recommendations and develop guidance materials aimed at improving aeronautical meteorological services through the use of existing and/or new procedures, facilities and technologies;

g) Review and identify inter-regional and intra-regional co-ordination issues in the field of aeronautical meteorology and, as necessary, recommend actions to address those issues; and

h) Identify and progress environmental initiatives related to aeronautical meteorology.

3. Establishment of the MET SG

3.1. The Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) established the MET SG to assist in its planning and implementation work, charging MET SG with preparatory work on specifically defined problems in the field of aeronautical meteorology requiring expert advice for their resolution. APANPIRG also appointed MET SG as the 'parent' group for other contributory bodies working in the field of aeronautical meteorology for APANPIRG.

4. Membership of the MET SG

4.1. Membership of the MET SG comprises experts provided by States, whether Members or not of the APANPIRG, International Organizations and bodies having experience in the provision of aeronautical meteorological information and services.

5. Chairing and Secretary of the MET SG

5.1. The MET SG shall elect a Chairperson, and Vice-Chairperson if needed, from the experts provided by States. The maximum term of the Chairperson and Vice Chairperson is four years. The Secretary of APANPIRG will appoint the Secretary of the MET SG.

6. Meetings of the MET SG

6.1. The Chairperson of the MET SG, in consultation with Members and the Secretary, shall decide the date and duration of Meetings. As a rule, the MET SG should agree, at each Meeting, on the date and duration of the next Meeting and on a tentative schedule of future Meetings.

7. Documentation and Record of Meetings of the MET SG

7.1. The MET SG shall record the proceedings of its Meetings in the form of a Report or a Summary and submit the Report or Summary for review and consideration by APANPIRG. A Meeting Report should cover completed action on any part of the MET SG work plan and outline the needs of MET SG for further directives or guidance from the APANPIRG to proceed in its work. Reports on Meetings shall be of a simple layout and as concise as practicable and should normally cover:

a) Short introduction;

b) Summary of findings (presented in the order of discussion of the agenda items, including any proposals for action); and

c) Work plan and schedule for future Meetings.

7.2. The Secretary should publish the Report as early as practicable (21-days) after the Meeting.

7.3. The Secretary should disseminate the meeting invitation as early as practicable, i.e., not less than 3-months before the Meeting, and reminders for submission of papers approx. 6-weeks and 1-week before the due date for submission of papers.

7.4. Contributors should submit papers to the ICAO Secretariat as early as practicable, i.e., 28-days before the Meeting at which they are intended to be considered. The Secretary should publish papers, and send a notification of their availability, as early as practicable, i.e., 14-days before the Meeting at which they are intended to be considered.

7.5. The Secretary, in consultation with the Chairperson, may decide to accept papers submitted less than 28-days before the Meeting at which they are intended to be considered when there is a clear benefit to the Meeting in doing so.

8. Delegated authority of the MET SG

8.1. The MET SG may propose actions for further consideration by APANPIRG and record these in the MET SG Report as either draft Conclusions or draft Decisions of APANPIRG.

8.2. Additionally, APANPIRG has empowered MET SG to adopt proposals for action on technical matters (especially those concerning guidance to States in the implementation of ICAO SARPs and global and regional plans) that do not have additional economic, environmental, inter-regional or political effects, which should be considered by APANPIRG. The MET SG shall record these in its Meeting Report as Conclusions or Decisions of MET SG.

9. Work Plan of the MET SG

	Detailed description of deliverable	Responsibility	Target date	Status of progress
a) to h)	**Coordination meeting** for the Chairs of MET SG, MET/R WG, MET/IE WG, MET/S WG, VOLCEX/SG	Chair MET SG and Secretary	Dec 2020 Mar 2021 Jun 2021 Sep 2021	In progress
a)	**Draft amendment proposal** for APAC ANP to fulfil missing data in Tables MET	MET/S WG	Mar 2020	In progress
a)	**Draft amendment proposal** for APAC ANP to clarify the MET-related implementation planning guidance in the ANRF and other parts of Volume III	MET/IE WG MET/S WG MET/R WG	Mar 2020	In progress
b) c)	**Analysis** of APAC Regional SIGMET test	MET/S WG (Task 1 and 3) MET/IE WG (Task 3)	Mar 2020	Completed
b) c)	**Analysis** of APAC Regional OPMET-availability monitoring exercise	MET/IE WG (Task 1)	Mar 2020	Completed
b) c)	**Analysis** of APAC Regional OPMET-timeliness, -compliance and -regularity monitoring exercises	MET/IE WG (Task 2)	Mar 2020	Completed
b) g)	**Analysis** of APAC Regional VAAC backup tests	MET/IE WG (Task 4)	Mar 2020	Completed
b) g)	**Analysis** of APAC Regional IROG backup tests	MET/IE WG (Task 5)	Mar 2020	Completed
b)	**Revised draft regional guidance material** on MET information needed to support the elements of the APAC Seamless ~~ATM~~ANS Plan	MET/R WG (Task 3)	Mar 2020	In progress
c)	**Analysis** of APAC Regional SIGMET monitoring exercises	MET/S WG (Task 1)	Mar 2020	Completed
b) c) g)	**Final report** on ICAO volcanic ash exercise APAC VOLCEX 18/01 (Papua New Guinea)	APAC VOLCEX/SG (Task 5)	TBD	Not started
b) c) g)	**Final report** on ICAO volcanic ash exercise APAC VOLCEX 18/02 (Indonesia/Sumatra)	APAC VOLCEX/SG (Task 6)	Completed	Completed
b) c) g)	**Final report** on ICAO volcanic ash exercise APAC VOLCEX 19/01 (Raoul Island, affecting Fiji's area of responsibility)	APAC VOLCEX/SG (Task 7)	Completed	Completed
b) c) g)	**Final report** on ICAO volcanic ash exercise APAC VOLCEX 20/01 (North-east Asia)	APAC VOLCEX/SG (Task 8)	Jun 2020	Not started
b) c) g)	**Final report** on ICAO volcanic ash exercise APAC VOLCEX 19/02 (Philippines)	APAC VOLCEX/SG (Task 9)	Jun 2020	Not Started
c) d)	**Proposal** to update the APANPIRG AN deficiencies database to add/remove deficiencies in the MET field	MET SG Chair, Secretariat	Aug 2019	Completed

	Detailed description of deliverable	Responsibility	Target date	Status of progress
c) d)	**Reporting form updates** showing the status of implementation of corrective action for the resolution of AN Deficiencies in the MET field	MET/S WG (Task 2 and 6)	Mar 2020	In progress
e) f) g)	**First draft of input** to the Regional SIGMET Guide to assist States in aligning cross-FIR-boundary SIGMET information	MET/R WG (Task 1) MET/S WG (Task 4)	Completed	Completed
f)	**First draft of input** to the Regional SIGMET Guide on the use of objective criteria supporting the issuance of SIGMET information for thunderstorm	MET/S WG (Task 4)	Completed	Completed
f)	**Progress report** on implementation and testing of IWXXM exchange	MET/IE WG (Task 5)	Jun 2020	Completed
f) g)	**ROBEX Handbook updates** to support improved efficiency and effectiveness of the ROBEX scheme; develop new table indicating COMM links and status	MET/IE WG (Task 6)	Mar 2020	Completed
g)	**Information** on ICAO provisions related to meteorological authority and quality assurance, cost recovery, competency, training and qualifications for meteorological service provision shared with States	MET SG Chair, Secretariat	Jun 2020	In progress
g)	**Analysis** of MET information used in the Region specifically to support ATM operations	MET/R WG (Task 2)	Jun 2020	In progress
g)	**Plan** for seminar on regional implementation of MET information to support ATM operations	MET/R WG (Task 5)	Jun 2020	In progress
h)	**Environmental Issues** Identify issues in the field of aeronautical meteorology related to environmental issues	MET SG Chair, Secretariat	Jun 2020	In progress
b) e) g)	**IWXXM workshop** Plan and conduct the IWWXM workshop	Secretariat, MET/IE Chair, MET SG Chair, Hong Kong China, Singapore	April/May 2020	Completed
f) g)	**SIGMET Guide update** Update the Regional SIGMET Guide to align with Annex 3, Amendment 79	MET/S WG (ad-hoc group)	Jun 2020	Completed
e) f) g)	**SIGMET coordination activities in APAC Region** Coordinate on the next steps to promote integration and expansion of SIGMET coordination activities among States/Administrations.	MET/S WG (MET/R WG)	Jun 2020	In progress

— END —

Agenda Item 4: Regional Air Navigation Deficiencies

4.1 Status of Air Navigation Deficiencies in the Asia/PAC Region (WP/14)

4.1.1 Under the Terms of Reference, the APANPIRG had been regularly reviewing the status of implementation of the Asia Pacific Air Navigation Plan through its subgroups to identify and address the air navigation deficiencies according to the uniform methodology approved by the ICAO Council. In meeting this objective, APANPIRG facilitated the development and implementation of action plans by States to resolve identified deficiencies, where necessary.

Deficiencies in the ATM and Airspace Safety fields

4.1.2 APANPIRG/31 noted the List of Air Navigation Deficiencies in the ATM and Airspace Safety fields which was reviewed and updated by ATM/SG/8 (23 – 27 November 2020) based on information provided by concerned States as follows:

a) AIS (WGS84) – Thailand deletion;

b) AIS (Quality Assurance) – Indonesia and Thailand deletion;

c) SAR capability – India and Indonesia deletion;

d) Non Provision of Safety-related Data – Bangladesh, Bhutan, French Polynesia, Lao PDR, Pakistan deletion;

e) LTHM – Malaysia deletion; and

f) Data Link Performance Monitoring – Myanmar deletion.

4.1.3 **Appendix A** to Report on Agenda Item 4 (reproduced from the same Appendix in APANPIRG/31 WP/14) presented the updated List of Air Navigation Deficiencies in the ATM and Airspace Safety fields.

Deficiencies in the AOP field

4.1.4 APANPIRG/31 noted the List of Air Navigation Deficiencies in the AOP field which was reviewed and updated by AOP/SG/4 (10 – 13 November 2020).

4.1.5 In accordance with the Conclusion APANPIRG/30/4 (Certification of aerodromes used for international operations in Asia Pacific States), new deficiencies related to the certification of aerodromes used for international operations and publication of the status of certification of aerodromes in AIP, as identified and endorsed by AOP/SG/4 Meeting, are included in **Appendix B**.

4.1.6 Subsequent to AOP/SG/4, the List was further updated after Bangladesh and Thailand provided evidence about aerodrome certification and AIP respectively. **Appendix B** to Report on Agenda Item 4 (reproduced from the same Appendix in APANPIRG/31 WP/14) presented the updated List of Air Navigation Deficiencies in the AOP field.

4.1.7 Bangladesh advised the Meeting that the full name of VGSY was “Osmani International Airport, Sylhet”, and suggested that a common layout be adopted for Air Navigation Deficiency List in different fields. APANPIRG/31 noted the remarks from ICAO Headquarters that the *uniform methodology for the identification, assessment and reporting of air navigation deficiencies* was being reviewed and targeted to complete in Q3 2021.

4.1.8 Japan advised the Meeting that the Japan Civil Aviation Bureau did not have the power to certify the four aerodromes listed under Japan in **Appendix B** to Report on Agenda Item 4, as they were operated by the defence agency. In response, the Secretariat reminded the Meeting of Standard 1.4.1 of Annex 14, Volume I, which stipulated that States shall certify aerodromes used for international operations, and this Standard applied to all such aerodromes regardless of ownership or operators. In this connection, the Meeting noted that ICAO Headquarters had been requested to provide guidance on an alternative safety oversight framework for military aerodromes undertaking limited civil international operations (**Conclusion APANPIRG/31/8** under Agenda Item 3.1 refers). The Meeting also noted that the Aerodrome Design Working Group was reviewing Doc 9774 *Manual on Certification of Aerodromes*, and relevant guidance might be available subsequently.

Deficiencies in the CNS field

4.1.9 APANPIRG/31 noted the list of Air Navigation Deficiencies in CNS field which was reviewed and updated by CNS SG/24 (30 November – 4 December 2020). **Appendix C** to Report on Agenda Item 4 (reproduced from the same Appendix in APANPIRG/31 WP/14) presented the updated List of Air Navigation Deficiencies in the CNS field.

4.1.10 The CNS SG/24 Meeting noted the information provided by China, highlighting the improvement in bilateral communication and surveillance between China and Pakistan, and the Hot Spot E (Lahore-Urumqi) had been removed at the RASMAG/25. Therefore, the CNS SG/24 Meeting agreed the removal of the deficiency for Pakistan & China from APANPIRG Air Navigation Deficiency list, which was first reported in May 2014 at RASMAG/19, recorded in "Reporting Form on Air Navigation Deficiencies in the CNS Fields".

Deficiencies in the MET field

4.1.11 APANPIRG/31 noted the list of Air Navigation Deficiencies in MET field which was reviewed and updated by MET/SG/24 (16 – 20 November 2020). **Appendix D** to Report on Agenda Item 4 (reproduced from the same Appendix in APANPIRG/31 WP/14) presented the updated List of Air Navigation Deficiencies in the MET field.

4.1.12 MET SG/24 formulated a specific Draft Conclusion (MET SG/24-04: Resolution of Air Navigation Deficiency AP-MET-01, refers) supporting the removal of the APANPIRG air navigation deficiency (AP-MET-01) concerning aerodrome meteorological observations or reports at Honiara (AGGH), Solomon Islands.

4.1.13 The abovementioned Draft Conclusion (formulated by MET SG/24) is subsumed under the comprehensive Draft Conclusion proposed below.

4.1.14 MET SG/24 also decided on further specific actions for the Sub-group to enhance the identification and resolution of air navigation deficiencies in the MET field (Decision MET SG/24-05: MET Deficiencies, refers).

4.1.15 APANPIRG/31 was provided with information on new deficiencies identified in ATM and Airspace Safety, and AOP fields, and those deficiencies that had been rectified by States in ATM and Airspace Safety, AOP, CNS and MET fields.

4.1.16 APANPIRG/31 noted that it was the responsibility of States with Deficiencies to provide updates to ICAO APAC Office so that the information in the Deficiency database could be updated in a timely manner. The Regional Office would update the Deficiencies database based on written evidence provided by the respective Administrations.

4.1.17 APANPIRG/31 reviewed the Air Navigation Deficiencies as presented in **Appendices A to D** to Report on Agenda Item 4 and endorsed as current list of APANPIRG Air Navigation Deficiencies. APANPIRG/31 also adopted the following Conclusion:

<table>
<tr><td colspan="2">Conclusion APANPIRG/31/19 – Update of Information in APANPIRG Air Navigation Deficiencies Reporting Form</td></tr>
<tr><td>That,
1) ICAO to update the APANPIRG Air Navigation Database to reflect the information as presented in Appendices A to D to Report on Agenda Item 4.

2) States/Administrations be urged to:
a) establish action plan with defined target dates for resolution of deficiencies, update the status on the corrective action taken and report progress in the Reporting Form of Air Navigation Deficiencies identified in ATM and Airspace Safety, AOP, CNS and MET fields as detailed in Appendices A to D to the WP/14; and

b) update contact details of a Focal Point to coordinate actions to resolve the Deficiencies.</td><td>Expected impact:
☐ Political / Global
☐ Economic
☐ Environmental
☐ Inter -Regional
☒ Ops/Technical</td></tr>
<tr><td>Why: The resolution of air navigation deficiencies in the ATM and Airspace Safety, AOP, CNS and MET fields (in the APANPIRG database) have lacked satisfactory progress over several years, due in part to inadequate information in the Reporting Form, e.g., infrequent updates and lack of concise and concrete Corrective Action Plans with defined target dates</td><td>Follow-up: ☒Required from States</td></tr>
<tr><td>When: official reports providing full details of the corrective actions taken where deficiencies have been resolved be reported to sub-groups in 2021.</td><td>Status: Adopted by PIRG</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other</td></tr>
</table>

4.2 Indonesia Corrective Actions on AIS & SAR Deficiencies (IP/08)

4.2.1 Indonesia shared with APANPIRG/31 the corrective actions taken to resolve Air Navigation Deficiencies in the AIM and SAR fields, regarding AIS Quality Management System and SAR Plan respectively.

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ATM and Airspace Safety Deficiencies List (Updated 27 November 2020)

	Deficiencies			**Corrective Action**		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
	WGS-84 Requirements of Paragraph 1.2.1 of Annex 15					
Afghanistan	WGS-84 - Not implemented	24/6/2014		Afghanistan	TBD	A
Bangladesh	WGS-84 - Not implemented	24/6/2014		Bangladesh	TBD	A
Bhutan	WGS-84 - Not implemented	2/7/1999	Data conversion completed, but not published	Bhutan	TBD	A
Brunei Darussalam	WGS-84 - Not implemented	24/6/2014		Brunei Darussalam	TBD	A
Marshall Islands	WGS-84 - Not implemented	24/6/2014		Marshall Islands	TBD	A
Micronesia	WGS-84 - Not implemented	24/6/2014		Micronesia	TBD	A
Nauru	WGS-84 - Not implemented		Conferring with consultant	Nauru	TBD	A
Palau	WGS-84 - Not implemented	24/6/2014		Palau	TBD	A
Samoa	WGS-84 - Not implemented	24/6/2014		Samoa	TBD	A
~~Thailand~~	~~WGS-84 - Not implemented~~	~~24/6/2014~~		~~Thailand~~	~~TBD~~	~~A~~
Vanuatu	WGS-84 – Not implemented	2/7/1999	Implemented at main airports	Vanuatu	1999	A
	AIP Format Requirements of Chapter 5 of Annex 15					
Kiribati	AIP Format - Not implemented	7/7/99	ATM/AIS/SAR/SG/18 (June 2009) was advised AIP in draft stage	Kiribati		A
Nauru	AIP Format - Not implemented	7/7/99	ATM/AIS/SAR/SG/18 (June 2008) was advised work soon to start	Nauru		A

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
	AIS Quality Management System Requirements of Paragraph 3.6.1 of Annex 15 Quality Management System - Not implemented					
Afghanistan	AIS Quality Management System - Not implemented	24/6/2014		Afghanistan	TBD	A
Bangladesh	AIS Quality Management System - Not implemented	24/6/2014		Bangladesh	TBD	A
Bhutan	AIS Quality Management System - Not implemented	24/6/2014		Bhutan	TBD	A
Brunei Darussalam	AIS Quality Management System - Not implemented	24/6/2014		Brunei Darussalam	TBD	A
Cambodia	AIS Quality Management System - Not implemented	24/6/2014		Cambodia	TBD	A
~~Indonesia~~	~~AIS Quality Management System - Not implemented~~	~~24/6/2014~~		~~Indonesia~~	~~TBD~~	~~A~~
Kiribati	AIS Quality Management System - Not implemented	24/6/2014		Kiribati	TBD	A
Lao PDR	AIS Quality Management System - Not implemented	24/6/2014		Lao PDR	TBD	A
Maldives	AIS Quality Management System - Not implemented	24/6/2014		Maldives	TBD	A

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
Marshall Islands	AIS Quality Management System - Not implemented	24/6/2014		Marshall Islands	TBD	A
Micronesia	AIS Quality Management System - Not implemented	24/6/2014		Micronesia	TBD	A
Myanmar	AIS Quality Management System - Not implemented	9/6/2016		Myanmar	TBD	A
Nauru	AIS Quality Management System - Not implemented	24/6/2014		Nauru	TBD	A
Nepal	AIS Quality Management System - Not implemented	24/6/2014		Nepal	TBD	A
Palau	AIS Quality Management System - Not implemented	24/6/2014		Palau	TBD	A
Philippines	AIS Quality Management System - Not implemented	24/6/2014		Philippines	TBD	A
Samoa	AIS Quality Management System - Not implemented	24/6/2014		Samoa	TBD	A
Solomon Islands	AIS Quality Management System - Not implemented	24/6/2014		Solomon Islands	TBD	A

	Deficiencies			**Corrective Action**		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
Sri Lanka	AIS Quality Management System - Not implemented	9/6/2016		Sri Lanka	TBD	A
~~Thailand~~	~~AIS Quality Management System – Not implemented~~	~~24/6/2014~~		~~Thailand~~	~~TBD~~	~~A~~
Timor-Leste	AIS Quality Management System - Not implemented	24/6/2014		Timor-Leste	TBD	A
Vanuatu	AIS Quality Management System - Not implemented	24/6/2014		Vanuatu	TBD	A
	Aeronautical Data Area of Responsibility - requirements of Paragraph 2.1.2 of Annex 2 to ensure that the provision of aeronautical data and aeronautical information covers its own territory and those areas over the high seas for which it is responsible for the provision of ATS					
Bangladesh	Aeronautical Data Promulgation Within the State's Area of Responsibility - Not implemented	29/03/2019 SAIOACG /9		Bangladesh	TBD	A
	Designation of Restricted Areas - requirements of Annex 2 (Definitions) to ensure that restricted areas are designated above the land areas or territorial waters of a State					
Australia	Designation of Restricted Areas Above the Land Areas or Territorial Waters of a State - Not implemented	29/03/2019 SAIOACG /9	Danger areas within international airspace that is part of a State's responsibility is acceptable	Australia	TBD	A
India	Designation of Restricted Areas Above the Land Areas or Territorial Waters of a State - Not implemented	29/03/2019 SAIOACG /9	Danger areas within international airspace that is part of a State's responsibility is acceptable	India	TBD	A

	Deficiencies			**Corrective Action**		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
Indonesia	Designation of Restricted Areas Above the Land Areas or Territorial Waters of a State - Not implemented	29/03/2019 SAIOACG /9	Danger areas within international airspace that is part of a State's responsibility is acceptable	Indonesia	TBD	A
	Airspace Classification Requirements of Paragraph 2.6 of Annex 11					
China	Airspace Classification - Not implemented	7/7/99	Difference to Annex 11 is published in AIP, China.	China	APANPIRG/19 updated, implementation planned by end 2010.	A
Macau, China	Airspace Classification - Not implemented	05/09/2018		Macau, China	TBD	A
Nauru	Airspace Classification - Not implemented	7/7/99		Nauru	TBD	A
Solomon Islands	Airspace Classification - Not implemented	7/7/99		Solomon Islands	TBD	A
	ATS Message Addressing Requirements of Doc 4444 PANS-ATM Section 11.4 (Message Types and their Application)		Note: the threshold for a Deficiency is 5% or more DEP messages reported to have not been sent, and where the analysed data provided evidence of a systemic (either systems or human factors) failure to send the message			

	Deficiencies			**Corrective Action**		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
Bangladesh	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Bangladesh	TBD	A
India	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	India	TBD	A
Malaysia	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Malaysia	TBD	A
Maldives	DEP message transmission	09/08/2019	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Maldives	TBD	A
Nepal	DEP message transmission	09/08/2019	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Nepal	TBD	A
USA	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	USA	TBD	A

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
	SAR capability: Requirements of Annex 12 as defined in the Regional Air Navigation Plan Volume II Part I – GENERAL PLANNING ASPECTS Section 3 SPECIFIC REGIONAL REQUIREMENTS, failure to reach 90% or more implementation of the Asia/Pacific SAR Plan					
Afghanistan	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 45%	Afghanistan	~~2016~~ 2019	U
Bangladesh	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/4 69%~~ APSAR/WG/5 65%	Bangladesh	2019	U
Bhutan	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 34%	Bhutan	~~2016~~ 2019	U
Brunei	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/4 63%	Brunei	2019	U
Cambodia	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 76%	Cambodia	2019	U
China	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/4 82%	China	2019	U
Cook Islands	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Cook Islands	2019	U
DPR Korea	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 66%	DPR Korea	2019	U
Fiji	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 80%	Fiji	2019	U
French Polynesia	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/4 84%	French Polynesia	2019	U
~~India~~ (Recommended by APSAR/WG/5)	~~Asia/Pacific SAR Plan~~	~~17/05/2019~~	~~APSAR/WG/4 88%~~ APSAR/WG/5 90%	~~India~~	~~2019~~	~~U~~

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
~~Indonesia~~ (Recommended by APSAR/WG/5)	~~Asia/Pacific SAR Plan~~	~~17/05/2019~~	~~APSAR/WG/4 87%~~ APSAR/WG/5 95%	~~Indonesia~~	~~2019~~	~~U~~
Kiribati	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 26%	Kiribati	2019	U
Lao PDR	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 57%	Lao PDR	2019	U
Macau, China	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 85%	Macao, China	2019	U
Malaysia	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/4 77%~~ APSAR/WG/5 78%	Malaysia	2019	U
Maldives	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 71%	Maldives	2019	U
Marshall Islands	Asia/Pacific SAR Plan	6/07/2015	~~APSAR/WG/4 0%~~ APSAR/WG/5 17%	Marshall Islands	2019	U
Micronesia	Asia/Pacific SAR Plan	6/07/2015	~~APSAR/WG/4 0%~~ APSAR/WG/5 17%	Micronesia	2019	U
Mongolia	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/4 63%	Mongolia	2019	U
Myanmar	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 67%	Myanmar	2019	U
Nauru	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Nauru	2019	U
Nepal	Asia/Pacific SAR Plan	6/07/2015	~~APSAR/WG/4 17%~~ APSAR/WG/5 56%	Nepal	2019	U
New Caledonia	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/4 54%	New Caledonia	2019	U

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
Palau	Asia/Pacific SAR Plan	6/07/2015	~~APSAR/WG/4 0%~~ APSAR/WG/5 17%	Palau	2019	U
Pakistan	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/4 84%	Pakistan	2019	U
Papua New Guinea	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Papua New Guinea	2019	U
Philippines	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 61%	Philippines	2019	U
Samoa	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Samoa	2019	U
Solomon Islands	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Solomon Islands	2019	U
Sri Lanka	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/4 60%~~ APSAR/WG/5 75%	Sri Lanka	2019	U
Thailand	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/4 82%~~ APSAR/WG/5 78%	Thailand	2019	U
Timor-Leste	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Timor-Leste	2019	U
Tonga	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Tonga	2019	U
Vanuatu	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Vanuatu	2019	U
	Non Provision of Safety-related Data Requirement of Paragraph 3.3.5.1 of Annex 11 (provision of data for monitoring the height-keeping performance of aircraft) and APANPIRG Conclusion 16/6 – Non Provision of safety related data by States					

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
Afghanistan	Non-provision of safety related data	12/07/2019	Failure to submit Kabul LHD data for January-December 2018 and 2020	Afghanistan	RASMAG26	U
~~Bangladesh~~	~~Non-provision of safety related data~~	~~12/07/2019~~	~~Failure to submit the 2018 TSD. Failure to submit Dhaka LHD data for January-December 2018~~	~~Bangladesh~~	~~RASMAG24~~	~~U~~
~~Bhutan~~	~~Non-provision of safety related data~~	~~12/07/2019~~	~~Failure to submit the annual RVSM approval snapshot for two consecutive years~~ RASMAG/25	~~Bhutan~~	~~RASMAG24~~	~~U~~
~~French Polynesia~~	~~Non-provision of safety related data~~	~~05/07/2018~~	~~Failure to submit the 2016, 2017 and 2018 TSD~~	~~French Polynesia~~	~~RASMAG23~~	~~A~~
~~Lao PDR~~	~~Non-provision of safety related data~~	~~13/07/2017~~	~~Failure to submit the annual RVSM approval snapshot for four consecutive years~~ RASMAG/25	~~Lao PDR~~	~~RASMAG23~~	~~A~~
~~Pakistan~~	~~Non-provision of safety related data~~	~~12/07/2019~~	~~Failure to submit Karachi LHD data for July-December 2018. Late submission of 2018 Karachi TSD~~	~~Pakistan~~	~~RASMAG24~~	~~U~~
	State Responsibility to comply with the Annex 6 Height-Keeping Monitoring Requirement Annex 6 Part I Section 7.2.9 (10th Ed.) and Part II Section 2.5.2.10 (9th Ed.)					
Afghanistan	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/ 23	Remaining monitoring burden of 85%~~38% reported in RASMAG/23~~ (RASMAG/25)	Afghanistan	RASMAG24	A
~~Malaysia~~	~~Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)~~	~~RASMAG/ 23~~	~~Remaining monitoring burden of 38% reported in RASMAG/23~~ RASMAG/25 26%	~~Malaysia~~	~~RASMAG24~~	~~A~~
Pakistan	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/ 22	Remaining monitoring burden of 46% (RASMAG/25)	Pakistan	RASMAG24	A
	Data Link Performance Monitoring and Analysis Requirements of Paragraph 2.28 and/or 3.3.5.2 of					

	Deficiencies			**Corrective Action**		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
	Annex 11 not met					
Fiji	Post-implementation monitoring not implemented	25/06/2018	Problem reports not provided to CRA. RASMAG24	Fiji	TBD	A
India	Post-implementation monitoring not implemented	13/07/2017	Performance monitoring and analysis was reported for the Chennai FIR, but was not reported for the Kolkata and Mumbai FIRs.	India	TBD	A
Maldives	Post-implementation monitoring not implemented	29/5/2015	Problem Reports not provided to CRA. Performance monitoring and analysis not reported to FIT.	Maldives	TBD	A
~~Myanmar~~	~~Post-implementation monitoring not implemented~~	~~29/5/2015~~	~~Problem Reports not provided to CRA.~~ RASMAG/25	~~Myanmar~~	~~TBD~~	~~A~~

** Note: In accordance with the *APANPIRG Handbook - Asia/Pacific Supplement to the Uniform Methodology for the Identification, Assessment and Reporting of Air Navigation Deficiencies*, priority for Air Navigation Deficiencies is guided by the principle that a deficiency with respect to an ICAO Standard is accorded a "U" status, while a non-compliance with a Recommended Practice or a PANS is considered as "A" or "B" subject to additional expert evaluation. The final prioritization of deficiencies is the prerogative of APANPIRG.

AIR NAVIGATION DEFICIENCIES IN AOP FIELD IN THE ASIA/PACIFIC REGION

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Afghanistan							
Annex 14 Volume I	**Herat International Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Kabul International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Kandahar International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Mazar-e-Sharif Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	American Samoa (US)							
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

AIR NAVIGATION DEFICIENCIES IN AOP FIELD IN THE ASIA/PACIFIC REGION

Updated 27 Nov 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Bangladesh							
Annex 14 Volume I	**Hazrat Shahjalal International Airport, Dhaka**	**Runway/ Taxiway**	**ICAO mission April 2009**	Runway strip width insufficient (280m strip not available for the full length of runway);	runway strip in accordance with Annex 14, volume I will be provided	CAABD	Runway strip width 280m available for the full length of runway (mitigation measures for storm water drain on the western side strip under process. No obstructions on graded area)	A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Brunei Darussalam		ICAO Mission of April 2011					
Annex 14 Volume I	**Brunei International Airport**	~~**Runway**~~		vegetation along pavement edges and strip higher than the adjacent runway pavement; uneven earth mounds on strip faded centre line and other markings;	All pavement edges and strips are cleared from vegetation and lower than adjacent runway pavement especially after the completion of the Airfield Pavement Rehabilitation Project in Nov 2017. Earth mounds previously found on taxiways strips have been destroyed and flattened.	Airport Operator (DCA Aerodrome Division)	Completed Completed (CLOSED)	A A
		Taxiway		non provision of enhanced taxiway centre line marking in accordance with Para 5.2.8 of Annex 14, Volume I Objects on taxiway strips; vegetation on pavement joints and maintenance of joints	Both Northern Parallel Taxiway and Southern Parallel Taxiway Centre line have been repainted yellow and enhanced with black borders on each side.	Airport Operator (DCA Aerodrome Division)		A A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
		Apron		non provision of ICAO compliant signage in accordance with section 5.4 Annex 14, Volume I	Airfield signages have always been provided at BIA that follow ICAO standards and measurement. Recent replacement of old and faded labels have also been completed in 2018.	Airport Operator (DCA Aerodrome Division)		A
		Rescue and Fire Fighting (RFF):		non provision of direct access for the rescue and fire fighting vehicles from the fire station into the runway;	Duly noted that there is no direct access for fire fighting vehicles to the runway at the moment, but one will be concluded within the second phase of the Airfield Pavement Rehabilitation Project.	Airport Operator (DCA Aerodrome Division)	4th Qtr. 2022	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
				non provision of road holding position sign at all road entrances to a runway; and	Brunei International Airport aerodrome does not have any roads that link directly to the runway and all access areas via taxiways and have their signages in place. Other areas have been enhanced with 'STOP' marking prior to entrance.	Airport Operator (DCA Aerodrome Division)	Completed (CLOSED)	A
		Wildlife Hazards:		Establishing a national bird control committee in accordance with APANPIRG Conclusion 18/1.	Aerodrome Division headed by Head of Aerodrome to firstly establish an in-house committee and will cooperate with Regulatory Division	Airport Operator (DCA Aerodrome Division)	4th Qtr. 2021	B
		Aerodrome Certification	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

AIR NAVIGATION DEFICIENCIES IN AOP FIELD IN THE ASIA/PACIFIC REGION

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	China							
Annex 14 Volume I	**Hualien Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Taichung Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Tainan Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of some of the aerodromes used for international operations yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I PANS-Aerodromes PANS-AIM	**Cook Islands** AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Fiji Islands							
Annex 14 Volume I	**Nadi International Airport**	**Runway/ Taxiway**	**ICAO mission June 2010**	Provision of RESA in accordance with Section 3.5 of Annex 14, Volume I requirements;	RESA will be provided	**Airport Operator – Fiji Airports**	ACTION TAKEN (PARTIALLY COMPLETED):- RESA provided for the runway ends:- *RWY 09 – 90mx90m (compliant) *RWY 20 - 90mx90m (compliant) *RWY 02 – 30m x 90m (limited due to the Localizer aerial) *RWY 27 – nil (limited due to sea located at the end of the strip area) Information published in the State AIP For the **non-compliant** RWY 02 and RWY 27, a safety case has been presented by the Aerodrome Operator for issue of an Exemption until RESA is able to be provided in 2020. **Target date – End of 2020**	A

AIR NAVIGATION DEFICIENCIES IN AOP FIELD IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Nausori International Airport**	**Runway/ Taxiway**	**June 2010**	Provision of RESA in accordance with Section 3.5 of Annex 14, Volume I requirements.	RESA will be provided	**Airport Operator – Fiji Airports**	ACTION TAKEN (PARTIALLY COMPLETED): RESA provided for runway ends:- *RWY 10 – 30mx30m (limited due to airport boundary) *RWY 28 - nil (limited due to public road) Information published in the State AIP **A safety case has been presented by the Aerodrome Operator for issue of an Exemption until RESA is able to be provided in 2020.** **Target date – End of 2020**	A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Guam (US)							
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	India							
Annex 14 Volume I	**Chennai International Airport**	**Runway**	**AGA mission January 2009**	Runway strip is insufficient 300m strip width is not available for the full length of runway 07/25 in accordance with 3.4.3 of Annex 14, Volume I.	~~300~~ 280m strip width for full length of runway 07/25 will be made available.	AAI	Work in progress. Due to COVID-19 work is held up. PDC for straightening of B taxiway alone is 30-09-2020. ~~October 2019. Presently distance between RWY 25 Centerline to TWY 'A' is 123m and to provide RWY Strip of 150m, TWY 'B' will be straightened from intersection TWY 'C'.~~	A
Annex 14, Volume I	**Mumbai International Airport**	**Runway**	**AGA mission January 2009**	Runway strip is insufficient 300m strip width is not available for the full length of runway 09/27 in accordance with 3.4.3 of Annex 14, Volume I.	~~300~~ 280m strip width for full length of runway 09/27 will be made available	MIAL	31 Dec 2022. ~~31 Dec 2020.~~ Due to presence of slum in beginning of RWY 09/27 south – RWY strip ~~300~~ 280m not available. Due to presence of slum of either side at beginning of RWY 14/32 – RWY strip ~~300~~ 280m not available.	A
Annex 14 Volume I	**Chandigarh Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A

AIR NAVIGATION DEFICIENCIES IN AOP FIELD IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Goa Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I	**Port Blair Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I	**Pune Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I	**Srinagar Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	**AIP**	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of some of the aerodromes used for international operations yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Japan							
Annex 14 Volume I	**Hyakuri Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Komatsu Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Tokushima Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Miho Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of some of the aerodromes used for international operations yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Kiribati							
Annex 14 Volume I	**Christmas Island Airport, Kiritimati**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Bonriki International Airport, Tarawa	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Lao PDR** **Wattay International Airport**	**Taxiway**	**ICAO Mission of March 2011**	Provision of runway hold position lights in accordance with Para 5.3.19 of ICAO Annex 14, Volume I	Under consideration by Airports of Laos to purpose for support the budgets and installation			A
				Provision of enhanced taxiway centre line marking in accordance with Para 5.2.8 of Annex 14, Volume I		Already completed by Airports of Laos in December 2018	Provided Completed [CLOSED]	
		Rescue and Fire Fighting (RFF):		Provision of road holding position sign at all road entrances to a runway;	Completed the design and submit to DCA for Approval		Will complete in December 2019	A
		Wildlife Hazards:		Establishing a national bird control committee in accordance with APANPIRG conclusion 18/1.	We are repairing plan for estiblition committee for approval from Ministry		Will complete in December 2019	B
		Aerodrome Certification	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Luang Prabang International Airport	**Taxiway**		Provision of runway hold position lights in accordance with Para 5.3.19 of ICAO Annex 14, Volume I on new taxiways	Under consideration by Airports of Laos to purpose for support the budgets and installation			A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
		Rescue and Fire Fighting (RFF)		Provision of road holding position sign at all road entrances to a runway	Completed the design and submit to DCA for Approval		Will complete in December 2019	A
		Aerodrome Certification	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Savannakhet International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Pakse International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Malaysia** **Kuantan Haji Ahmad Shah Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Labuan Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of some of the aerodromes used for international operations yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I PANS-Aerodromes PANS-AIM	**Marshall Islands** AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 12 June 2019

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Maldives							
Annex 14, Volume I	**Velana International Airport**	**Runway/ Taxiways**	**AGA Mission Report April 2008**	Insufficient runway strip.	Runway strip available	Maldives Airports Company Pvt. Ltd	Apron is still within the runway strip. New master plan work is in progress, new runway construction on-going, estimated date of completion: December 2019. Exemption granted by the State to Aerodrome Operator till December 2019.	U

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Micronesia (Federated States of) Pohnpei International Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	FM Chuuk International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Yap International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Kosrae Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Nauru							
Annex 14 Volume I	**Nauru International Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I PANS-Aerodromes PANS-AIM	**Niue (New Zealand)** AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I PANS-Aerodromes PANS-AIM	**New Zealand** AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I PANS-Aerodromes PANS-AIM	**Northern Mariana Islands (US)** AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Palau							
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

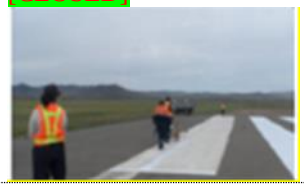
Updated 20 Nov 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Philippines							
Annex 14 Volume I	**Kalibo International Airport, Akla**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Puerto Princesa International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Bohol-Panglao International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 2 July 2020

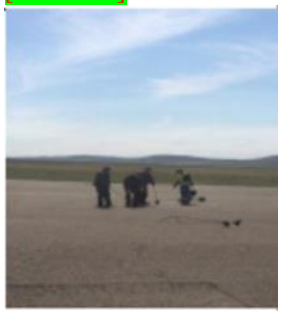
Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Mongolia							
Annex 14 Volume I	~~**Ulaan Baatar International Airport**~~ **Buyant-Ukhaa Airport**	**Runway**	**ICAO Mission of July 2011**	rubber deposits and faded centre line and other faded markings;	Rubber deposits will be removed. The faded lines and faded markings will be provided.	Civil Aviation Authority of Mongolia	The rubber deposits were removed within the 180m² area of the runway strip in 2017.   The faded lines and faded markings were remarked each year. [CLOSED]	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
		Taxiway		Resealing cracks on pavement surface with sealants to prevent ingress of water and broken edges which could cause FOD issues.	The cracks will be fixed.	Civil Aviation Authority of Mongolia	  The cracks among with 5445 meter long on the pavement surface of the taxiway, were fixed in 2017 as per prescribed in Aerodrome Manual. [CLOSED]	A
		Taxiway		Provision of enhanced taxiway centre line marking in accordance with Para 5.2.8 of Annex 14, Volume I.	The taxiway centre line marking will be provided in accordance with Para 5.2.8 of Annex 14, Volume I.	Civil Aviation Authority of Mongolia	The taxiway enhanced center line were painted in 2017, as per Para 5.2.8 of Annex 14, Volume I. [CLOSED]	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
							 	
		Taxiway		faded taxiway markings	The taxiway markings will be repainted.	Civil Aviation Authority of Mongolia	The faded taxiway markings were repainted within the totally 10305 m2 area in 2017, by using 1157 kg white paint, 887.25 kg yellow paint, 42 kg black paint, 98 kg red paint, 756.5 kg diluent and 674.5 kg reflectors, as per Aerodrome Manual. [CLOSED] 	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
								
		Taxiway		Maintenance of pavement cracks	Pavements cracks will be fixed.	Civil Aviation Authority of Mongolia	The pavement cracks within the totally 66.24m² area of the taxiway were repaired by using 10749.35 kg cold mix asphalt and 400 kg modified cements in 2017 as per Aerodrome Manual. [CLOSED] 	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
		Taxiway		provision of runway hold position lights in accordance with Para 5.3.19 of ICAO Annex 14, Volume I.	The runway hold position lights will be provided in accordance with Para 5.3.19 of ICAO Annex 14, Volume I.	Civil Aviation Authority of Mongolia	The RWY hold position marking and mandatory signs were provided to avoid runway incursions on the maneuvering area. Because of the existing International scheduled flights will be transferred to new airport in 2020, the additional runway hold position lights are unrequired to install.	A
				provision of taxiway hold position signs on all hangar taxiways at entrances to the active taxiways/runway.	The taxiway hold position signs on all hangar taxiways at entrances to the active taxiways/runway will be provided.	Civil Aviation Authority of Mongolia	The taxiway information signs on all hangar taxiways at entrances to the active taxiway were provided in 2017. Also intermediate holding position marking were provided on hangar taxiways. [CLOSED] 	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
								
		Apron		sealing the cracks on the apron surface	The cracks on the apron surface will be resealed.	Civil Aviation Authority of Mongolia	Total 12840m long cracks on the apron surface were resealed in 2017, as per Aerodrome Manual and in scope of Aerodrome maintenance plan. [CLOSED] 	A
		Airfield signage		Provision of ICAO compliant signage in accordance with section 5.4 Annex 14, Volume I and to cut the vegetation in front of the signs.	The signage will be provided in accordance with section 5.4 Annex 14, Volume I. The vegetation in front of the signs will be cut	Civil Aviation Authority of Mongolia	The work on cutting the vegetation in front of the signs was completed in 2017 within the totally 119560 m² area including, taxiway strip, glide path antenna and apron area, as per Aerodrome manual of, in scope of Aerodrome	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
							maintenance plan. 	
		Wildlife Hazards		establishing a national bird control committee in accordance with APANPIRG conclusion 18/1; collect wildlife reports and forward to ICAO for inclusion in the ICAO IBIS.	The National Bird Control Committee will be established committee in accordance with APANPIRG Conclusion 18/1. The wildlife reports will be submitted to the ICAO IBIS annually.	Civil Aviation Authority of Mongolia	"National bird strike prevention program" was approved by the 48th order of the Minister of Road and Transport, Mongolia, 2 March, 2016. The National Bird Strike Committee was established by the 95th order of the Minister of Road and Transport, Mongolia, 14 April 2016. [CLOSED]	B B

Updated 2 July 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Myanmar Yangon International Airport**	**Runway/ Taxiway**	**ICAO mission April 2010**	Provision of RESA in accordance with Section 3.5 of Annex 14, Volume I requirements;	RESA will be provided	Yangon Aerodrome Company Limited	(Risk Assessment conducted by the operator submitted on 10 Aug 2018.) RESA for RWY 21 was completed on 15 Nov 2018. See Annex Pg-3. _____ ~~**RESA for RWY 03 30 Nov 2019**~~ Revised date-**31 Dec 2020**	A
		Bird Hazard		Establishment of a national bird committee in accordance with APANPIRG Conclusion 18/1.	Establish National Bird Committee	Department of Civil Aviation	Guideline for Wildlife Hazard Management at Aerodromes, DCA-GM-AGA 08 has been developed and published on 29 Oct 2018) ~~31 Dec 2019~~ Revised date-**31 Aug 2020**	B
Annex 14, Volume I	**Mandalay International Airport**	**Runway/ Taxiway**	**April 2010**	Provision of RESA in accordance with Section 3.5 of Annex 14, Volume I requirements;	RESA will be provided	MC-Jalux Airport Services Co; Ltd;	(Risk Assessment conducted by the operator submitted on 15 March 2019) ~~31 Dec 2019~~ Completed on **27 March 2020** [CLOSED]	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14, Volume I	**Nepal** ~~**Kathmandu International Airport**~~ **Tribhuvan International Airport**	**Runway/ taxiways**	**ICAO Mission of February 2008**	Provision of RESA in accordance with section 3.5 of ICAO Annex 14, Volume I.	RESA will be provided	Tribhuvan International airport/ CAAN	~~Estimated Implementation Date (Start of work): 06/08/2017 dated of completion 31/01/2019~~ Estimated Implementation Date is 30/09/2020 (Civil construction works already completed)	U
				Insufficient runway strip, refer recommendations given in section 3.4 of Annex 14, Volume I.	Provide runway strip as per ICAO recommendations		~~Master Plan Review of TIA is in process from Intl. Consulting firm.~~ TIA Master Plan Review from Int'l Consulting firm, first phase of construction will to start within 2020.	A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Pakistan							
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of one of the aerodromes used for international operations yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Samoa** **Faleolo International Airport**	**Runway Strip**	**ICAO Mission of Oct. 2015**	Insufficient Runway Strip				A
		Aerodrome Pavements		Lack of maintenance of aerodrome pavements in accordance with Annex 14, 10.2				U
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Solomon Islands** **Honiara International Airport/Henderson Field**	**Runway Strip**	**ICAO Mission of Oct. 2015**	Insufficient Runway Strip				A
		RESA		RESA at both ends of runway not provided				U
		Aerodrome Pavements		Lack of maintenance of aerodrome pavements in accordance with Annex 14, 10.2				U
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Sri Lanka** **Bandaranaike International Airport**	**Runway/ Taxiway**	**ICAO mission April 2010**	Provision of 280m strip width for the full length of precision approach CAT I runway in accordance with the standard 3.4.3, Annex 14, Volume I; remove obstacles from runway strip; flush the strip with the adjacent runway shoulder.	runway strip in accordance with Annex 14, Volume I will be provided, obstacles from strip will be removed and flush strip with adjacent runway shoulder.	CAASL	AASL has informed that the Runway Safety Team – BIA will carry out the safety study and submit the report by June 2018. Preliminary Report of the Safety Study of AASL was reviewed in April 2018.	A
				Establishment of a national bird committee in accordance with APANPIRG Conclusion 18/1.	National Bird Committee will be established.		1st Draft of TOR of National Bird Control Committee of Sri Lanka has been compiled and ready for ratification.	A

Updated 9 Dec 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14, Volume I	**Thailand** **Phuket International Airport**	**Runway**	**AGA mission of July 2009**	RESA to satisfy Section 3.5 of Annex 14, Volume I requirements.	RESA will be provided at the end of both RWY09 and RWY27 to satisfy Section 3.5 of Annex 14, Volume I requirements. Remark: - Dimension of RESA RWY09 is 150x190 m. - Dimension of RESA RWY27 is 150x120 m.	Airports of Thailand Public Company Limited	~~Runway End Safety Area will be provided to satisfy Section 3.5 of Annex 14, Volume I requirements. The construction is expected to be completed in 2021.~~ The construction is expected to be completed in 2022. Currently, the construction plan has been approved. The budget approval is in progress.	U
				Runway strip width insufficient (280m runway strip for precision approach runways in accordance with Para 3.4.~~5~~ 3 of Annex 14, Volume I.	~~280m~~ 300m runway strip width ~~for full length of runway~~ will be made available. Except 111.4m length at the beginning of RWY09 (60m strip length before RWY09 threshold plus 51.4m length beyond the threshold), the runway strip width will be extended 150m on the right	Airports of Thailand Public Company Limited	~~280m runway strip width for full length of runway will be provided. The project is expected to be completed by 2021.~~ The construction is expected to be completed by 2022. Currently, the construction plan has been approved. The budget approval is in progress.	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
					side of RWY09 centre line and 90.27m on the left side of the runway centre line (due to the marsh near the runway).			
	Krabi Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Hua Hin Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	U-Taphao Pattaya International Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Samui Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Surat Thani Airport	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
~~**Annex 14 Volume I PANS-Aerodromes PANS-AIM**~~	~~AIP~~	~~**Status of Certification of Aerodromes in AIP**~~	~~Effective from 1 Jan 2021~~	~~Status of certification of aerodromes yet to be published in AIP AD 1.5.~~				~~A~~

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Timor-Leste							
Annex 14 Volume I	**Presidente Nicolau Lobato International Airport, Dili**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
	Commander-in-Chief of the FALINTIL – Kay Rala Xanana Gusmão International Airport, Suai	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Tonga							
Annex 14 Volume I	**Fua'amotu International Airport**	**Runway Strip**	**ICAO Mission of Oct. 2015**	Insufficient Runway Strip				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I	**Tuvalu** **Funafuti International Airport**	**Aerodrome Certification**	Effective from 1 Jan 2021	Aerodrome yet to be certified.				A
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Vanuatu							
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of aerodromes yet to be published in AIP AD 1.5.				A

Updated 30 Oct 2020

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
	Viet Nam							
Annex 14 Volume I	**Noi Bai International Airport, Hanoi**	**Bird Hazard**	**ICAO mission March 2010**	Wildlife strike report submission to ICAO for inclusion in IBIS.	Submission of wildlife strike reports to ICAO for inclusion in IBIS.	Airport Operator (ACV)	- Airport Operator (ACV) periodically reports to CAAV about wildlife strike according to CAAV's Decision 399/QD-CHK dated February 25th 2015 on aviation safety report. - CAAV submitted 2016, 2017, 2018 wildlife strike reports to ICAO on December 17th 2018, and has started to periodically submit wildlife strike reports to ICAO for inclusion in IBIS since 2019. [CLOSED] ~~Quarter I, 2018~~ ~~Airport Corporation of Viet Nam (ACV) annually reports to CAAV about wildlife strike, bird information as well as measures to control incidents from birds according to Regulation 399/CHK issued by CAAV about safety report.~~ ~~CAAV is developing data base and is preparing report submission to ICAO for inclusion in IBIS.~~	B

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14, Volume I	**Tan Son Nhat International Airport, Ho Chi Minh City**	**Runway/ Taxiway**	**March 2010**	Provision of RESA in accordance with Section 3.5 of Annex 14, Volume I requirements;	Provide RESA	Airport Operator (ACV)	**WORK IN PROGRESS** * RESA for the runway 25L/07R: The runway is being re-designed for upgrading and setting up the RESA. **Target date of completion: End of 2020**. * RESA for the runway 25R/07L: **Target date of completion: End of 2021.** **Exemption granted by CAAV to Airport Operator till RESA is able to be provided.** ~~December 2018~~ ~~At present, Tan Son Nhat Intl airport is re-designed for upgrading the runways and setting up the RESA.~~	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
				Wildlife strike report submission to ICAO for inclusion in IBIS.	Submission of wildlife strike reports to ICAO for inclusion in IBIS.	Airport Operator (ACV)	- Airport Operator (ACV) periodically reports to CAAV about wildlife strike according to CAAV's Decision 399/QD-CHK dated February 25th 2015 on aviation safety report. - CAAV submitted 2016, 2017, 2018 wildlife strike reports to ICAO on December 17th 2018, and has started to periodically submit wildlife strike reports to ICAO for inclusion in IBIS since 2019. [CLOSED] ~~Quarter I, 2018~~ ~~Airport Corporation of Viet Nam (ACV) annually reports to CAAV about wildlife strike, bird information as well as measures to control incidents from birds according to Regulation 399/CHK issued by CAAV about safety report. CAAV is developing data base and is preparing report submission to ICAO for inclusion in IBIS.~~	B

AIR NAVIGATION DEFICIENCIES IN AOP FIELD IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective Action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date of completion**	**Priority for action****
Annex 14 Volume I PANS-Aerodromes PANS-AIM	AIP	**Status of Certification of Aerodromes in AIP**	Effective from 1 Jan 2021	Status of certification of one of the aerodromes used for international operations yet to be published in AIP AD 1.5.				A

* Priority for action to remedy the shortcoming is based on the following safety assessments:

"U" priority = Urgent requirements having a direct impact on safety and requiring immediate corrective actions. Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

"A" priority = Top priority requirements necessary for air navigation safety. Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

"B" priority = Intermediate requirements necessary for air navigation regularity and efficiency. Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

(Updated 04 December 2020)

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE CNS FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective Action			
Requirement	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action**
Reliable ground to ground communication as specified in the regional Air Navigation Plan (Doc.9673) Tables CNS II-1; CNS II-2 & CNS II-3	Afghanistan and Pakistan	Unreliability of AFS communication between Afghanistan and Pakistan was brought to the notice of APANPIRG/21. Lack of reliability in the AFS including data communication between Kabul and Karachi and ATS voice communication between Lahore and Kabul was identified.	September 2010	A follow-up COM coordination meeting held in July 2019 discussed way forward	1. Site visits in Pakistan by expert from the VSAT service provider were made in February and March 2016. Remedial recommendations were provided to CAA. Pakistan. 2. Both Afghanistan and Pakistan agreed to as first step to recover the VSAT connection by upgrading terminals in Lahore and Karachi. Afghanistan will provide assistance and does the Network Configuration settings; 3. Both States also agreed to implement CRV as soon as practical to resolve the existing COM deficiencies.	CAA. Afghanistan and CAA. Pakistan	June 2020	A

Identification		Deficiencies			Corrective Action			
Requirement	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action**
~~Regional Air Navigation Plan – Vol. II – Tables CNS II-2; CNS II-3 & CNS II-APAC-1~~	~~Pakistan & China~~	~~Improvement of ATS Direct Speech circuit performance and A/G communication and surveillance coverage between China and Pakistan~~	~~May 2014 RASMAG/19 Updated in July 2019~~	~~In early 2017, a hotline connection changing to a new service provider at Pakistan side was made. Some improvements have been achieved.~~	~~While the performance of the ground/ground ATS speech communication between Lahore and Urumqi and the air/ground communication and surveillance coverage over PURPA crossing point having been much improved both China and Pakistan agreed to optimize the ground-ground communications through CRV. After the CRV implementation completed, the schedule for implementation of AMHS, AIDC, ADS-B data sharing and ATS direct speech circuit between the two States will be established.~~	~~ATMB. China and CAA. Pakistan~~	~~June 2020~~	~~A~~

Editorial Note:
Proposed updates endorsed by MET SG/24 shows deleted text using strikeout (~~text to be deleted~~), and added text with grey shading (text to be inserted).

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ Facilities** (Index No.)	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
MWO and SIGMET service (Annex 3: Chapter 3, 3.4 and Chapter 7)	**Democratic Peoples' Republic of Korea** (DPRK) (AP-MET-16)	Requirements for MWO and SIGMET service not established for Pyongyang FIR	2008	Reported by ICAO Regional Office mission	Establish MWO to provide required service, including SIGMET information for Phnom Penh FIR. **See notes below for more information.**	GACA, Democratic Peoples' Republic of Korea	TBC	A
Meteorological observations and reports. (Annex 3: Chapter 4)	**Kiribati** (AP-MET-02)	METAR from Kiribati not available on regular basis.	1998	Reported by airlines	Equipment to be installed and arrangements to be made for regular observations and reports, including: training of personnel; maintenance of equipment; calibration and verification of meteorological observations; and proper/secure transmission of data. **See notes below for more information.**	State designated MET authority	TBC	A
Meteorological information for operators and flight crew members, including forecasts provided by the WAFCs (Annex 3: Chapter 9)	**Kiribati** (AP-MET-18)	WAFC forecasts not available for inclusion in flight briefings and documentation	2008	Reported by TCB CAEMSA-SP Technical Expert	Implement procedures and systems for the required meteorological information to be supplied to operators and flight crew members, including forecasts generated from the digital forecasts provided by the WAFCs. **See notes below for more information.**	State designated MET authority	TBC	U
Meteorological information for operators and flight crew members, including forecasts provided by the WAFCs (Annex 3: Chapter 9)	**Nauru** (AP-MET-19)	WAFC forecasts not available for inclusion in flight briefings and documentation	2008	Reported by TCB CAEMSA-SP Technical Expert	Implement procedures and systems for the required meteorological information to be supplied to operators and flight crew members, including forecasts generated from the digital forecasts provided by the WAFCs. **See notes below for more information.**	State designated MET authority	TBC	U

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ Facilities** (Index No.)	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
Meteorological observations and reports. (Annex 3: Chapter 4)	**Nauru** (AP-MET-21)	METAR/SPECI service not provided	2008	Reported by TCB CAEMSA-SP Technical Expert	Equipment to be installed and arrangements to be made for regular observations and reports, including: training of personnel; maintenance of equipment; calibration and verification of meteorological observations; and proper/secure transmission of data. **See notes below for more information.**	State designated MET authority	TBC	U
Provision of SIGMET information (Annex 3, Chapter 7)	**Nauru** (AP-MET-24)	Lack of SIGMET issued for the Nauru FIR.	Sep 2011	IATA deemed this situation unsafe and unacceptable to airline operations.	Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. **See notes below for more information.**	State designated MET authority	TBC	U
Provision of SIGMET information (Annex 3: Chapter 7)	**Nepal** (AP-MET-14)	Requirements for issuance and dissemination of SIGMET information for Kathmandu FIR have not been fully implemented	2000		Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. **See notes below for more information.**	State designated MET authority	TBC	A
Reporting of information on volcanic eruptions to civil aviation units. (Annex 3, 3.6, 4.8)	**Papua New Guinea** (AP-MET-04)	Information on volcanic activity not provided regularly to ATS units, MWOs and VAACs.	1995	Observed by States concerned. Reported at the WMO/ICAO Workshop on Volcanic Ash Hazards (Darwin, 1995)	Establish arrangements for State volcano observatories to send the required volcano observation information as quickly as practicable to the associated ACC/FIC, MWO and VAAC. **See notes below for more information.**	Rabaul Volcano Observatory, NWS and ASL of Papua New Guinea	TBC	A

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ Facilities** (Index No.)	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
Provision of SIGMET for volcanic ash (Annex 3: Chapter 7)	**Papua New Guinea** (AP-MET-08)	Requirements for issuance and proper dissemination of SIGMET for volcanic ash have not been fully implemented	Dec 2003	Reported by airlines, noted by Volcanic Ash Advisory Centres and confirmed by ICAO mission	Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of volcanic ash. **See notes below for more information.**	NWS of Papua New Guinea	TBC	U
Provision of SIGMET information (Annex 3, Chapter 7)	**Papua New Guinea** (AP-MET-22)	Lack of SIGMET issued for the Port Moresby FIR.	Sep 2011	IATA deemed this situation unsafe and unacceptable to airline operations.	Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. **See notes below for more information.**	State designated MET authority	TBC	U
Meteorological observations and reports. (Annex 3: Chapter 4)	**Solomon Islands** (AP-MET-01)	Weather information is inadequate and not provided on a regular basis	1996	Reported by airlines operating to Solomon Islands	Equipment to be upgraded and arrangements to be made for regular observations and reports, including: training of personnel; maintenance of equipment; calibration and verification of meteorological observations; and proper/secure transmission of data. MET SG/24 proposes that APANPIRG removes AP-MET-01 from the open list. **See notes below for more information.**	Solomon Is. MET Service	TBC	A
Meteorological information for operators and flight crew members, including forecasts provided by the WAFCs (Annex 3: Chapter 9)	**Solomon Islands** (AP-MET-20)	WAFC forecasts not available for inclusion in flight briefings and documentation	2008	Reported by TCB CAEMSA-SP Technical Expert	Implement procedures and systems for the required meteorological information to be supplied to operators and flight crew members, including forecasts generated from the digital forecasts provided by the WAFCs. **See notes below for more information.**	State designated MET authority	TBC	U

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ Facilities** (Index No.)	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
Provision of SIGMET information (Annex 3, Chapter 7)	**Solomon Islands** (AP-MET-23)	Lack of SIGMET issued for the Honiara FIRs.	Sep 2011	IATA deemed this situation unsafe and unacceptable to airline operations.	Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. **See notes below for more information.**	State designated MET authority	TBC	U
Reporting of information on volcanic eruptions to civil aviation units. (Annex 3: 3.6, 4.8)	**Tonga** (AP-MET-17)	Information on volcanic activity not provided regularly to ATS units, MWOs and VAACs	2008	Reported by TCB CAEMSA-SP technical expert	Establish arrangements for State volcano observatories to send the required volcano observation information as quickly as practicable to the associated ACC/FIC, MWO and VAAC. **See notes below for more information.**	MOI and MEIDECC	TBC	U

NOTES:

Index No.	State	Update Date	NOTES ON <u>OPEN</u> DEFICIENCIES
~~**AP-MET-01**~~	~~Solomon Islands~~	~~September 2017~~	~~APANPIRG/28 noted that Solomon Islands should:~~ ~~• Verify the status of implementation of CAP; and~~ ~~• Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.~~
		~~June 2019~~	~~MET SG/23 requested the Secretary in conjunction with support from other States to provide Solomon Islands with assistance in preparing the full report on rectification of the deficiency.~~
		November 2020	MET SG/24 concurred that Solomon Islands completed corrective action to ensure provision of aerodrome meteorological observations or reports is in compliance with ICAO SARPs. Resolution of the deficiency is validated by users and OPMET monitoring results. MET SG/24 proposes that APANPIRG removes AP-MET-01 from the open list. Draft Conclusion MET SG/24-04, refers.
AP-MET-02	Kiribati	September 2017	APANPIRG/28 noted that Kiribati should: • Verify the status of implementation of CAP; and

Index No.	State	Update Date	NOTES ON OPEN DEFICIENCIES
			• Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-04	Papua New Guinea	September 2017	APANPIRG/28 noted that Papua New Guinea should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-08	Papua New Guinea	September 2017	APANPIRG/28 noted that Papua New Guinea should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-14	Nepal	September 2017	APANPIRG/28 noted that Nepal should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-16	Democratic People's Republic of Korea	September 2017	APANPIRG/28 noted that DPRK should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-17	Tonga	10 May 2013	Ministry of Infrastructure (MOI), Civil Aviation Division, advised that: • MOU established between the national authority providing volcano monitoring (Ministry of Lands, Environment, Climate Change and Natural Resources – MLECCNR) and the national authority providing meteorological service for international air navigation (MOl) for the reporting of volcanic activity to the associated ACCs, MWOs and VAACs in accordance with the relevant ICAO SARPs.
		29 May 2017	MOI, Civil Aviation Division, advised that: • Relevant operating procedures implemented in the units concerned and case studies of real volcanic events presented as evidence of the State volcano observatory's issuance of the required volcano observation information.
		September 2017	APANPIRG/28 noted that: • Removal of the deficiency from the open list is subject to the concurrence of the ATS units, MWOs and VAACs concerned that the deficiency is resolved.
		June 2018	MET SG/22 noted that: • VAAC Wellington was coordinating with Tonga on the validation of corrective action taken to resolve the deficiency.
AP-MET-18	Kiribati	September 2017	APANPIRG/28 noted that Kiribati should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.

Index No.	State	Update Date	NOTES ON OPEN DEFICIENCIES
AP-MET-19	Nauru	September 2017	APANPIRG/28 noted that Nauru should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-20	Solomon Islands	September 2017 June 2019	APANPIRG/28 noted that Solomon Islands should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency. MET SG/23 requested the Secretary in conjunction with support from other States to provide Solomon Islands with assistance in preparing the full report on rectification of the deficiency.
AP-MET-21	Nauru	September 2017	APANPIRG/28 noted that Nauru should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-22	Papua New Guinea	September 2017	APANPIRG/28 noted that Papua New Guinea should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-23	Solomon Islands	September 2017 June 2019	APANPIRG/28 noted that Solomon Islands should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency. MET SG/23 requested the Secretary in conjunction with support from other States to provide Solomon Islands with assistance in preparing the full report on rectification of the deficiency.
AP-MET-24	Nauru	September 2017	APANPIRG/28 noted that Nauru should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.

Index No.	State	Update Date	NOTES ON CLOSED DEFICIENCIES
AP-MET-01	Solomon Islands	December 2020	Removed from the open list; APANPIRG/31 Conclusion 31/xx, refers.
AP-MET-03	Indonesia	September 2017	Removed from the open list, APANPIRG/28 Conclusion 28/29 refers.
AP-MET-05	–	–	This Index No. is not used.

Index No.	State	Update Date	NOTES ON CLOSED DEFICIENCIES
AP-MET-06	Indonesia	September 2017	Removed from the open list, APANPIRG/28 Conclusion 28/29 refers.
AP-MET-07	Philippines	November 2019	Removed from the open list, Conclusion APANPIRG/30/19, refers.
AP-MET-09	Cambodia	September 2018	Removed from the open list, APANPIRG/29 Decision 29/23 refers
AP-MET-10	–	–	This Index No. is not used.
AP-MET-11	Cambodia	September 2018	Removed from the open list, APANPIRG/29 Decision 29/24 refers
AP-MET-12	Lao PDR	September 2018	Removed from the open list, APANPIRG/29 Decision 29/24 refers
AP-MET-13	–	–	This Index No. is not used.
AP-MET-15	–	–	This Index No. is not used.

Acronyms/Abbreviations/Definitions

ACC — Area control centre
ASL — Air Services Ltd.
ATS — Air traffic services
CAEMSA-SP — Cooperative Agreement for the Enhancement of Meteorological Services to Aviation - South Pacific
CAAP — Civil Aviation Authority Philippines
CAP — Corrective action plan
FIC — Flight information centre
FIR — Flight information region
GACA — General Administration of Civil Aviation
IATA — International Air Transport Association
MEIDECC — Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communication
MET — Meteorological

Acronyms/Abbreviations/Definitions

METAR	— Aerodrome routine meteorological report *(in meteorological code)*
MWO	— Meteorological watch office
NWS	— National Weather Service
PAGASA	— Philippine Atmospheric, Geophysical and Astronomical Services Administration
PHIVOLCS	— Philippine Institute of Volcanology and Seismology
SIGMET	— Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations
SPECI	— Aerodrome special meteorological report *(in meteorological code)*
SSCA	— State Secretariat of Civil Aviation
TBC	— To be confirmed
TCB	— Technical Cooperation Bureau (of ICAO)
VAAC	— Volcanic ash advisory centre
WAFC	— World area forecast centre
WMO	— World Meteorological Organization

Agenda Item 5: Future Work Programme

APANPIRG Work Programme 2021-2022 (WP/15)

5.1 APANPIRG/31 agreed with the tentative schedule of meetings for 2021 and 2022, placed in **Appendix** to the Report on Agenda Item 5, and noted that a formal letter of invitation would normally be issued by the Secretariat at least 3 months prior to each event, as well as posted on ICAO APAC website.

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Appendix

2021 – MEETINGS, WORKSHOPS AND SEMINARS		
Meetings	**Tentative Dates**	**Venue**
AP-ADO/TF/2	January	VTC
APA TF/7 (AIDC TF)	First half of the year	TBD
AP-AAWG/3	February	VTC
SAIOACG/11/SEACG/28	February – March TBC	VTC
MET/IE WG/19	22 – 24 March	Virtual Meeting
ATFM/SG/11	22 – 26 March	TBD
MET/S WG/11	24 – 26 March	Virtual Meeting
SRWG/5	March	VTC
DAPs WG/4	March	TBD
VOLCEX/SG/7	Q1 (TBC)	Virtual Meeting
GBAS/SBAS ITF/3	March/April	VTC
APA-CDM/TF/6	April	Bangkok
AAITF/16	19 – 23 April	TBD
SURICG/6	27 – 30 April	TBD
APSAR/WG/6	03 – 06 May	TBD
MET/R WG/10	May (TBC)	Virtual Meeting or Bangkok
AP-WHM/WG/3	May	Bangkok
CRV OG/8	May/June	TBD
FIT-Asia/11	21 – 24 June	Bangkok
AOP/SG/5	Last week of June	Bangkok
PBNICG/8	June/July	VTC
RASMAG/26	05 – 09 July	Bangkok
MET/SG/25	July (TBC)	Virtual Meeting or Bangkok
PIRG/RASG Coordination Meeting	July	Bangkok
ATM/SG/9	02 – 06 August	Bangkok
APANPIRG/32 and RASG-APAC/11	November	TBD
ATMAS/TF/2	2nd half of 2021	Chengdu, China
APA TF/7 (AIDC TF)	2nd half of 2021	Bangkok
CNS SG/25	2nd half of 2021	Bangkok
ACSICG/8	2nd half of the year	TBD
AFSSP WG 2021 (APAC Aeronautical Fixed Service Safety and Protection Planning Working Group)	After ACSICG/8	USA
SWIM TF/5	After May	TBD
ICAO APAC IWXXM Seminar or Workshop	Q3 or Q4 (TBD)	TBD
Second APAC Ministerial Conference on Civil Aviation	TBC	India
AFSSP WG (to be considered by ACSICG/8)	TBD	TBD
57th DGCA Conference	TBD	TBD

2022 – MEETINGS, WORKSHOPS AND SEMINARS		
Meetings	**Tentative Dates**	**Venue**
CRV OG/9	January	Bangkok
AP-ADO/TF/3	January	Bangkok
AP-AAWG/4	February	Bangkok
MET/IE WG/20	March	Virtual Meeting or Bangkok
MET/S WG/12	March	Virtual Meeting or Bangkok
DAPs WG/5	March	TBD
SAIOACG/12	March	Bangkok
PBNICG/9	March/April/TBC	Bangkok
GBAS/SBAS ITF/4	April	TBD
SRWG/6	April	Bangkok
SEACG/29	April	TBD
ATFM/SG/12	April	TBD
SURICG/7	April/May	TBD
SWIM TF/6	May	Bangkok
MET/R WG/11	May	Virtual Meeting or Bangkok
APSAR/WG/7	May	TBD
AP-WHM/WG/4	May	Bangkok
ACSICG/9	May	Bangkok
AOP/SG/6	June	Bangkok
ATMAS TF/3	June	TBD
AAITF/17	June	TBD
MET/SG/26	July	Virtual Meeting or Bangkok
CNS SG/26	July	Bangkok
FIT-Asia/11	July	Bangkok
RASMAG/27	July	Bangkok
PIRG/RASG Coordination Meeting	July	Bangkok
ATM/SG/10	July/August	Bangkok
APANPIRG/33 and RASG-APAC/12	August	Bangkok
VOLCEX/SG/8	TBC	Virtual Meeting or Bangkok
58th DGCA Conference	TBD	TBD

ACRONYMS

AAITF	Aeronautical Information Services – Aeronautical Information Management Implementation Task Force
ACSICG	Aeronautical Communication Services (ACS) Implementation Co-ordination Group
AOP/SG	Aerodrome Operations and Planning Sub Group
AP-AA/WG	Asia/Pacific Aerodrome Assistance Working Group
APAC AIG	Asia Pacific Accident Investigation Group
APA-CDM/TF	Asia/Pacific Airport Collaborative Decision Making Task Force
AP-ADO/TF	Asia/Pacific Aerodrome Design and Operations Task Force
APANPIRG	Asia/Pacific Air Navigation Planning and Implementation Group
APA/TF	Asia/Pacific ATS Inter-Facility Data-Link Communication (AIDC) Implementation Task Force (APA/TF)
APSARWG	Asia Pacific Search and Rescue Working Group
APUASTF	Asia Pacific Unmanned Aircraft System Task Force
AP-WHM/WG	Asia/Pacific Wildlife Hazard Management Working Group
ATFM/SG	Air Traffic Flow Management Steering Group
ATM/SG	ATM/Sub Group
ATMAS TF	ATM Automation System Task Force
CNS/SG	CNS Sub-Group of APANPIRG
CRV OG	Common Regional Virtual Private Network (VPN) Operations Group
CSMMTC - MCIS	CAA Senior and Middle Managers Training Course (CSMMTC) on Managing Compliance with ICAO SARPs (MCIS)
DAPs WG	Mode S Downlinked Aircraft Parameters Working Group
FIT-Asia	FANS Interoperability Team-Asia
FPP SCM	Flight Procedure Programme Steering Committee
GBAS/SBAS ITF	GBAS and SBAS Implementation Task Force
ISTF	Ionospheric Study Task Force
MET/IE WG	Meteorological Information Exchange Working Group (of the MET/SG)
MET/R WG	Meteorological Requirements Working Group (of the MET/SG)
MET/SG	Meteorology Sub-Group of APANPIRG
MET/S WG	Meteorological Services Working Group (of the MET/SG)
PBNICG	Performance Based Navigation Implementation and Coordination Group
PSIDS	Pacific Small Islands Developing States – Aviation Needs Analysis
RACP/TF	Regional ATM Contingency Planning Task Force
RASMAG	Regional Air Space Monitoring Advisory Group of APANPIRG
SAIOACG	South Asia/Indian Ocean ATM Coordination Group
SEACG	South East Asia ATS Coordination Group
SEA/BOB ADS-B WG	South East Asia and Bay of Bengal Sub-regional ADS-B Implementation Working Group
SRWG	Spectrum Review Working Group
SURICG	Surveillance Implementation Coordination Group
SWIMTF	System Wide Information Management Task Force
VOLCEX/SG	(APAC) Volcanic Ash Exercises Steering Group

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Agenda Item 6: Any other business

Combined APANPIRG and RASG-APAC Meeting Evaluation Considerations (WP/21)

6.1.1 The Combined APANPIRG and RASG-APAC meeting was supposed to be held in 2020 on a trial basis as per the meeting format decided at RASG-APAC/9 and APANPIRG/30 for better harmonisation and avoiding overlapping activities of both important annual forums. In cognisance of the health concerns and travel restrictions due to the COVID-19 pandemic, it was proposed to postpone the trial combined APANPIRG-RASG-APAC meeting to 2022 or later. It is envisaged that the APAC Region may explore the idea of a trial combined meeting of APANPIRG and RASG-APAC once the situation normalises. United States at APRAST/15 in June 2020 proposed some important considerations for evaluation of such a combined meeting. This paper presented the considerations/criteria discussed at APRAST/15 for evaluating the effectiveness and efficiency of a combined meeting format when such a meeting takes place in the future.

6.1.2 APANPIRG/31 adopted the following Conclusion:

<table>
<tr><td colspan="3">Conclusion APANPIRG/31/20: Evaluation of Combined APANPIRG and RASG-APAC Meeting</td></tr>
<tr><td colspan="2">What: Considering the postponement of the trial combined APANPIRG-RASG-APAC meeting to 2022 or later, the Meeting agreed that:

a) The Chairpersons and Vice-chairpersons of APANPIRG and RASG-APAC utilize the considerations contained in Appendix A to Report on Agenda Item 6 as well any other considerations received for the evaluation of the effectiveness of the trial combined meeting;
b) In view of the current COVID-19 pandemic, the evaluation of the effectiveness of the combined meeting be postponed to 2022 or later; and
c) A post-meeting survey possibly guided with content contained in Appendix B to Report on Agenda Item 6 be conducted among the meeting delegates after the combined meeting.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To evaluate the effectiveness of the combined APANPIRG and RASG-APAC trial meeting and determine the way forward</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 16-Dec-20</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: RASG-APAC</td></tr>
</table>

Note of Thanks

6.1.3 APANPIRG/31 thanked the following individuals from the ICAO Asia/Pacific Regional Office – Mr. Arun Mishra, Regional Director; Mr. Leonard C. Wicks, RO/ATM; Mr. Erdenebaatar Davaasuren, Associate RO/AIM; and Mr. Steven Ka Ho Pang, RO/AGA – for their exemplary service to APANPIRG and contributions to the Asia Pacific region over the years.

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Considerations for the Evaluation of Effectiveness of Combined APANPIRG and RASG-APAC Meeting

1. Did attendance increase/decrease in comparison to the previous two (2) years for each Group?

2. Did discussion of papers increase/decrease in comparison to the previous two (2) years?

3. How do the estimated hours needed per agenda item compare to the actual hours needed to accomplish each agenda item? Were all agenda items addressed?

4. What indicators resulted from the newly combined meeting that demonstrated increased collaboration and awareness between the RASG and PIRG?

5. Were the venue and logistics adequate? Did they contribute to the increased efficiency and effectiveness of the meeting? Were there any resource considerations that should be noted for the combined meeting format?

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Post-meeting Survey for the Combined APANPIRG and RASG-APAC Meeting

1. Did the meeting format provide participants with sufficient opportunity to address implementation issues related to regional safety and/or air navigation objectives, priorities and deficiencies, as well as emerging safety and/or air navigation concerns?

2. Did the meeting format provide ample time to identify specific deficiencies in the safety and/or air navigation fields, and propose actionable recommendations and timelines to resolve deficiencies in line with the GASP/GANP and regional priorities?

3. Did the combination of the PIRG and RASG meetings ensure that all safety and air navigation activities at the regional and sub-regional level are properly coordinated amongst role players to avoid duplication of efforts?

4. Did your State/Organization have adequate resources to participate in both meetings?

5. What elements of this proposed format worked well? What changes would you recommend to ensure the continued improvement of these meetings?

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Thirty First Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/31)

Video Teleconference - Bangkok, Thailand, 14 to 16 December 2020

Schedule: 10:00 – 13:15 Bangkok Time [UTC+7hrs]

LIST OF PARTICIPANTS

Number of States/Administrations	**23/2** *(154)*
International Organization	**7** *(16)*
Total no. of Participants	**170**
ICAO	*23*
Grand Total	**193**

AFGHANISTAN	***1***	*PAKISTAN*	***5***
AUSTRALIA	***2***	*PHILIPPINES*	***3***
BANGLADESH	***5***	*REPUBLIC OF KOREA*	***5***
BHUTAN	***4***	*SINGAPORE*	***8***
BRUNEI DARUSSALAM	***2***	*SRI LANKA*	***2***
CHINA	***13***	*THAILAND*	***8***
- HONG KONG CHINA	***7***	*USA*	***6***
- MACAO CHINA	***4***	*VIET NAM*	***6***
INDIA	***8***		
INDONESIA	***21***	*AAPA*	***2***
JAPAN	***7***	*ACI*	***1***
LAO DPR	***2***	*CANSO*	***1***
MALAYSIA	***7***	*IATA*	***7***
MALDIVES	***4***	*IFALPA*	***3***
MYANMAR	***12***	*IFATCA*	***1***
NEPAL	***9***	*IFATSEA*	***1***
NEW ZEALAND	***3***	*ICAO*	***23***

NAME			TITLE/ORGANIZATION	E-MAIL
1.	**AFGHANISTAN (1)**			
	1.	Mr. Mohammad Reza Khawary	CNS Inspector Civil Aviation of Afghanistan	khavari1001@gmail.com;
2.	**AUSTRALIA (2)**			
	2.	Mr. Brad Parker	Manager CNS/ATM Air Navigation, Airspace and Aerodromes Branch, CASA\Aviation Group	Brad.Parker@casa.gov.au;
	3.	Mr Glen Lang	Air Traffic Controller Airservices Australia	international@airservicesaustralia.com; ICAOOperations@AirservicesAustralia.com;

NAME			TITLE/ORGANIZATION	E-MAIL
3.	**BANGLADESH (5)**			
	4.	Mr. Mohammad Kamal Miah Sarker	Assistant Director (ATS) Civil Aviation Authority of Bangladesh	kamalm.sarker@yahoo.com;
	5.	Mr. Md Ayub Khan	Assistant Director/Senior Aerodrome Inspector, CAAB	ayubcaab@gmail.com;
	6.	Mr. Kazi Khirul Kabir	Senior Aerodrome Officer Civil Aviation Authority of Bangladesh	kkhirul@gmail.com;
	7.	Mr. Mohammad Shamsudduha	Senior Aerodrome Officer Civil Aviation Authority of Bangladesh	sdoha70@gmail.com;
	8.	Mr. Md Anwar Hossain	Asst NCMC & Aviation Safety Inspector (CNS) CAAB	ahossaincaab@gmail.com;
4.	**BHUTAN (4)**			
	9.	Mr. Sangay Wangdi	Chief ANAD Bhutan Civil Aviation Authority	swangdi@bcaa.gov.bt;
	10.	Mr. Karma Gayley	CNS Officer Bhutan Civil Aviation Authority Paro International Airport, Paro	kgayley@bcaa.gov.bt;
	11.	Mr. Karma Yonten	ATCO/AIS, National Air Navigation Services Company (NANSC) Bhutan	kyonten@doat.gov.bt;
	12.	Mr. Sangay	Dy Chief Communication Officer Department of Air Transport	sangay@doat.gov.bt;
5.	**BRUNEI DARUSSALAM (2)**			
	13.	Mr. Rasman Sulaiman	Aerodrome Inspector Department of Civil Aviation	rasman.sulaiman@dca.gov.bn;
	14.	Ms. Norhidayah Ismail	ATCO 1/ATS Inspector Department of Civil Aviation, Ministry of Transport and Infocommunication	norhidayah.ismail@dca.gov.bn;
6.	**CHINA (13)**			
	15.	Mr. Ruiqing Zhang	Deputy Director General of Air Regulation Office, Civil Aviation Administration of China (CAAC)	rq_zhang0@caac.gov.cn;
	16.	Ms. Jie Pan	Air Regulation Office Civil Aviation Administration of China	panjie@caac.gov.cn;
	17.	Mr. Bihe Wang	Flight Standard Department, CAAC	bh_wang@caac.gov.cn;
	18.	Ms. Tong Li	Airport Department, CAAC	Li_tong@caac.gov.cn;
	19.	Mr. Jingcheng Guo	Airport Department, CAAC	guojingcheng@caac.gov.cn;
	20.	Mr. Yang Lin	Air Traffic Management Bureau, CAAC	linyang@atmb.net.cn;
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Thirty First Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/31)

Video Teleconference - Bangkok, Thailand, 14 to 16 December 2020

Schedule: 10:00 – 13:15 Bangkok Time [UTC+7hrs]

THIRTY FIRST MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/31)

OPENING REMARKS BY

MR. ARUN MISHRA

REGIONAL DIRECTOR, ICAO ASIA AND PACIFIC OFFICE

14 DECEMBER 2020

- **Chairman and Vice Chairman of APANPIRG**
- **Directors General & Heads of Delegations**
- **Chairpersons of contributory bodies of APANPIRG**
- **Distinguished members of the States' Delegations**
- **Members of International Organizations, Participants, Colleagues**
- **Ladies and Gentlemen**

1. Good Morning and welcome to the 31th Meeting of APANPIRG. We are very happy to note that we have about 186 participants from 25 States and 7 International Organisations. I would like to introduce **Mr. Herman Pretorius** and **Mr. Hervé Forestier** from the Air Navigation Bureau, who are supporting this meeting from Montreal. While the large number of participants are always welcomed by the Regional Office I must apologize in advance for any inconvenience faced by the participants due to possible interruption of the internet and its bandwidth issues in this new virtual meeting format.

2. 2020 has proven to be the most challenging year in the history of Civil Aviation due to COVID-19. COVID-19 has now infected over 72 million people globally, and led to over 1.6 million fatalities. It has wreaked havoc on local and global air connectivity, and on the many countries and operators who once made that connectivity possible.

3. There is also some positive news, our region, with various States here has also being commended by the WHO for their pandemic response success, and it's important that government and industry decision makers continue to build upon these excellent APAC results. This is already evident by a resurgence in domestic traffic in many of the countries in APAC Region demonstrating a higher level of passenger confidence in air travel now as compared to the early days of COVID 19.

4. APAC Region has full potential to leverage Public Health Corridor or other near-term travel bubble solutions which can help accelerate the restoration of public confidence in air travel.

5. It is anticipated that once the COVID-19 situation will be under control, and States eases the lockdown requirements and border controls, air transport will resume normal operations to support the aviation ecosystem. In this regard, ICAO has developed i-Packs to facilitate States to cope with the various challenges of restarting operations following a partial or full closure of their operations, due to the COVID-19. You may contact us for further information on these iPacks.

6. During this pandemic, both APAC Regional Office and Regional Sub Office adapted various new ways to interact with our accredited States in the APAC region. We supported States in the implementation of the 14 CART Recommendations through ICAO APAC COVID-19 Contingency and Recovery Planning Group (ACCRPG) and its Sub-groups. ACCRPG has also served as a useful platform for sharing of COVID-19 related experiences and information. APAC Regional Office has conducted several webinars to facilitate States to file the COVID-19 Contingency Related Differences (CCRD). As a result, 92% of APAC States have submitted their CCRDs together with the associated information on the acceptance of Differences from other States to support continued aircraft operations in a harmonized and coordinated manner.

7. APAC RO has actively reached out to individual States to encourage and assist in updating COVID-19 Response and Recovery Implementation Centre (CRRIC) information providing the required implementation progress on the CART recommendations. Seizing this as an opportunity, APAC RO also organized several technical webinars to reaffirm all the regional roadmap targets and to share some basic knowledge on technical matters. This new way of working has also enabled us to reach out States who usually could not attend the APANPIRG and sub group meetings in the past.

8. Due to COVID-19 pandemic, we have postponed 57th Conference of Directors General of Civil Aviation and Second Ministerial Conference to 2021.

9. ICAO Council has also decided to postpone the applicability date for the implementation of new SARPs on Runway Conditions Report, which is commonly know as Global Reporting Format (GRF), from 5 November 2020 to 4 November 2021.

10. In my opening remarks today, I would not to go into the details of the wonderful work done by the various subgroups supported by staff of Regional Office even in this constrained environment, as these reports will be presented during the course of the meeting by the respective sub-groups.

11. This year while we have lesser number of WPs and IPs but their quality is of very high standard for which we are thankful to the contributors and I am confident that these Papers would stimulate constructive and useful discussions for our benefit. I would like to welcome our new Chair of APANPIRG, Mr. Kevin Shum, who was elected last year and also contributed to APANPIRG as Vice-Chair for last four years. I would also welcome our Vice Chair Mr Rajan Pokhrel, DG of Nepal. Further I would extend my appreciation to Chairs and Members of the various subsidiary bodies working under the APANPIRG for their significant contributions. The hard work put in by the staff of the Regional Office and the Regional Sub-Office to organize the various meetings and facilitate implementation of the decisions of the APANPIRG also needs to acknowledged.

12. In conclusion, whether we are talking about aviation safety or security, seamless skies, or any other aspect of international civil aviation, consistent and timely progress requires total and unfettered cooperation and collaboration. Always, the result is to provide users with the safest and most efficient mode of transportation possible.

13. This year, we have Loon LLC participating by virtually sponsoring our programme. Our sincere thanks to Loon.

We have a very tight schedule for the next three days followed by a two-day meeting of Regional Aviation Safety group. I would wish all of us a very successful APANPIRG meeting in this new virtual mode.

Thank you.

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ICAO

Thirty First Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/31)

Video Teleconference - Bangkok, Thailand, 14 to 16 December 2020

Schedule: 10:00 – 13:15 Bangkok Time [UTC+7hrs]

LIST OF WORKING PAPERS

Paper No.	Agenda Item	Title	Presented by
WORKING PAPERS			
WP/01	-	Adoption of the Provisional Agenda	Secretariat
WP/02	1A	Where does APAC Stand with the Beijing Declaration Commitments?	Secretariat
WP/03	1B.1	Review of the action taken by the ANC and the Council on the Report of APANPIRG/30 and RASG-APCA/9 and Outcome of the Council's Review of the Consolidated Annual Report on PIRGs and RASGs, covering the period from April 2019 to March 2020	Secretariat
WP/04	1B.2	Review status of implementation of APANPIRG/30 Conclusions and Decisions	Secretariat
WP/05	1B.3	Review status of implementation of APANPIRG outstanding Conclusions and Decisions	Secretariat
WP/06	1C	Progress Report of the APAC COVID-19 Contingency and Recovery Planning Group (ACCRPG)	Secretariat
WP/07	1D	Report of the Seventh Regional Coordination Meeting of PIRG and RASG	Secretariat
WP/08	1D	Outcomes of RASG-APAC/9 and APRAST/15 Meetings	Secretariat
WP/09 **Revision 1**	3.1	Report on the Fourth Meeting of AOP Sub Group	Chairperson of AOP/SG
WP/10	3.2	ATM/SG/8 Outcomes	ATM/SG Chair
WP/11	3.3	RASMAG Outcomes	RASMAG Chair
WP/12	3.4	Report on the Twenty Fourth Meeting of CNS Sub-Group	Secretariat
WP/13	3.5	Meteorology Sub-Group Report	Chair of MET SG
WP/14 **Revision 1**	4	Status of Air Navigation Deficiencies in the Asia/PAC Region	Secretariat

Paper No.	Agenda Item	Title	Presented by
WP/15	5	APANPIRG Work Programme 2021-2022	Secretariat
WP/16	1C	CANSO COVID-19 related activities in support of ATM	CANSO
WP/17 **Revision 1**	1C	ATM Contingency Measures and Recovery during COVID-19	Indonesia
WP/18	3.0	Implementation of Performance Measurement in Asia Pacific	Singapore
WP/19	3.2	FF-ICE and the Future of ATM	Singapore
WP/20	3.2	Open ATM – A New Approach to Future ATM Systems	Singapore
WP/21 **Revision 1**	6	Combined APANPIRG and RASG-APAC Meeting Evaluation Considerations	Secretariat

LIST OF INFORMATION PAPERS

Paper No.	Agenda Item	Title	Presented by
INFORMATION PAPERS			
IP/01	—	List of Papers	Secretariat
IP/02	2	Recent Developments of Interest	Secretariat
IP/03	3.2	Indonesia 5LNC Status and Progress	Indonesia
IP/04	3.2	Indonesia PBN Approach Chart Identification Transition Plan	Indonesia
IP/05	3.2	Operation of Unmanned Aircraft Systems within Indonesia National Airspace	Indonesia
IP/06	3.2	Implementation Status of Fatigue Management System for ATCOS	Republic of Korea
IP/07	3.5	Current Status and Plan of IWXXM Implementation in Indonesia	Indonesia
IP/08	4	Indonesia Corrective Actions on AIS & SAR Deficiencies	Indonesia

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APPENDIX 2

TERMS OF REFERENCE OF ASIA PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUPS (APANPIRG)

[Approved by the President of the ICAO Council on 20 April 2020]

1. MEMBERSHIP

1.1 All ICAO Contracting States, and Territories recognized by ICAO, within the area of accreditation of the ICAO Asia Pacific Regional Office and States of service providers in this air navigation region and part of this region's Air Navigation Plan, shall be members of the planning and implementation regional group (PIRG) established for Asia Pacific Region.

2. PARTICIPATION

2.1 In addition to States, the importance of a collaborative and proactive role by airspace users, international and regional organizations, and industry should be recognized due to their involvement in the rapid pace of technological development, expertise and other opportunities for sharing of resources.

2.2 PIRG meetings are open to all members. Each State/Territory member should be represented by a senior-level delegate nominated by the State/Territory, preferably from the civil aviation authority (CAA) in order to support related policy-making within the State. A delegate may be supported by an alternate delegate and/or advisers with the requisite technical knowledge in the subject matters under consideration.

2.3 The CAAs should be supported by service providers (such as air navigation services providers, airport, operators, meteorological service providers, etc.) as advisers.

2.4 States located outside the area of accreditation of the ICAO Regional Offices concerned can be invited on a case-by-case basis and in accordance with the *Regional Office Manual* to attend as observers.

2.5 International organizations recognized by the ICAO Council to participate in ICAO meetings should participate, as observers, in the PIRG meetings, and be encouraged to do so. Other stakeholders may be invited as observers, when required, to contribute to the work of the PIRG.

2.6 The participation of industry stakeholders should take into account relevant capabilities such as an involvement in the rapid pace of technological development, specific knowledge and expertise, and other opportunities including sharing of resources.

2.7 Civil aviation commissions/conferences in particular the Arab Civil Aviation Organization, African Civil Aviation Commission, European Civil Aviation Conference and Latin American Civil Aviation Commission, may be invited to participate in the work of the PIRGs.

2.8 The members and observers will serve as partners in PIRGs, and their joint commitment is fundamental for success in improving implementation and safety worldwide.

2.9 PIRG meetings should be live-streamed, to the extent possible, to enable additional State participants to follow the proceedings.

3. WORKING ARRANGEMENTS

3.1 Structure

3.1.1 PIRGs have the obligation to apply the most effective and efficient organizational structure and meeting modalities that best suit the characteristics of each region's implementation work programme while maintaining to the extent possible, alignment with these Terms of Reference, the regional work programme and the Global Air Navigation Plan (GANP).

3.1.2 The ICAO Regional Director(s) will serve as the Secretary of the PIRG. Wherever two Regional Directors are involved, they will periodically rotate between serving as Secretary of the PIRG and regional aviation safety group (RASG) to balance the Secretariat responsibilities between these two regional groups. The Secretary of the PIRG, in coordination with the Secretary of the RASG, will establish the date, methodology and the procedure to be applied for the rotation.

3.1.3 The organization of the PIRG should address global and region-specific air navigation-related matters, and meetings should be closely coordinated between the PIRG and RASG chairpersons and the Secretariat. PIRG and RASG meetings should be held back-to-back or combined to facilitate coordination and to ensure the efficient use of resources.

3.1.4 The PIRG shall be administered by a chairperson and one or two vice-chairpersons elected from the State-nominated delegates present. The PIRG will establish the cycle of elections.

3.1.5 The PIRG will build on the work already done by States, ICAO Regional Offices and existing regional and sub-regional organizations to support the development, maintenance and implementation of an air navigation plan for the region(s).

3.1.6 PIRG contributory bodies may be created by the PIRG to discharge the PIRG work programme by working on defined subjects requiring detailed technical expertise. A contributory body shall only be formed when it has been clearly established that it is able to make a substantial contribution to the required work. A contributory body will be dissolved by the PIRG when it has completed its assigned tasks or if the tasks cannot be usefully continued.

3.1.7 Invitations to PIRG meetings must be issued at least three months in advance of the meeting to assist States to plan participation.

3.1.8 The Secretariat will review and update the PIRG Handbook periodically, and as required, to ensure a result-oriented approach.

3.1.9 Where the meeting is held in more than one ICAO working language, interpretation services shall be made available to facilitate participation in the deliberations and adoption of the report by all participants.

3.1.10 States, international organizations and industry are invited to submit working papers, research works, etc. in order to enhance the work of the PIRG and its contributory bodies. To ensure proper time for consideration and good decision-making, the Secretary should ensure that all working papers are available at least fourteen days prior to the start of the meeting for consideration.

3.2 Venue

3.2.1 PIRG meetings will be convened in the Regional Offices, to the extent possible, to facilitate proper access by States. Approval to host PIRG meetings outside of the Regional Office must be obtained from the President of the Council.

3.2.2 The Secretary General will ensure the allocation of the necessary financial resources to host PIRG meetings.

3.2.3 PIRG contributory bodies may be convened at a different location, if required, to be determined by the Secretary and Chairperson of the PIRG, and contributory body. Venues shall be chosen with the primary aim of facilitating maximum State attendance.

3.3 **State role**

3.3.1 State CAAs, supported by service providers as necessary, should participate in the work of the PIRG and its contributory bodies to:

a) ensure the continuous and coherent development and implementation of regional air navigation plans and report back on the key performance indicators (KPIs);

b) support the regional work programme with participation from the decision-making authority with the technical expertise necessary for the planning and implementation mechanism, thus supporting policy decisions at the State level;

c) enable coordination, at the national level, between the CAA, service providers and all other concerned stakeholders, and harmonization of the national plans with the regional and global plans;

d) facilitate the implementation of GANP goals and targets;

e) report on the status of implementation, within the State, on a regular basis;

f) plan for basic services to be provided for international civil aviation in accordance with ICAO Standards, within State national plans;

g) facilitate the development and establishment of Letters of Agreement and bilateral or multilateral agreements;

h) mitigate deficiencies identified under the uniform methodology for the identification, assessment and reporting of air navigation deficiencies in a timely manner;

i) embrace a performance-based approach for implementation as highlighted in the Global Plans; and

j) ensure the inclusion of the regional priorities in the States' national implementation plans to the extent possible.

3.4 International organization and industry role

3.4.1 Industry, in particular airspace users, professional associations and organizations (such as Airports Council International, Civil Air Navigation Services Organisation, International Federation of Air Line Pilots' Associations, International Federation of Air Traffic Controllers' Associations, International Air Transport Association, etc.) should participate in the work of the PIRG and its contributory bodies, in order to support air navigation implementation and collaborative decision-making processes, taking into consideration the safety aspects of air navigation services.

3.4.2 Their focus should be on identifying regional requirements and ensuring that their available resources are adequately allocated.

3.5 Reporting

3.5.1 The PIRG reports outcomes to the ICAO Council through the Air Navigation Commission (ANC) as facilitated by the ICAO Secretariat.

3.5.2 PIRG meeting reports should be provided in a standardized format to the governing bodies of ICAO to identify regional and emerging challenges, and shall include as a minimum:

a) a brief history of the meeting (duration and agenda);

b) a list of meeting participants, affiliation and number of attendees;

c) a list of conclusions and decisions with a description of their rationale (what, when, why and how);

d) common implementation challenges identified amongst PIRG members and possible solutions, assistance required and estimated timelines to resolve, if applicable, by sub-region;

e) identification of and recommendations on particular actions or enhancements that would require consideration by the ANC and Council to address particular challenges, including the need for amendment proposals to global provisions and guidance materials submitted by States;

f) a list of issues cross-referenced to actions to be taken by ICAO Headquarters and/or Regional Offices;

g) based on the GANP, and associated KPIs and tools, report to the extent possible on the status of implementation of air navigation goals, targets and indicators, including the priorities set by the region in their regional air navigation plans exploring the use of regional dashboards to facilitate monitoring regional progress being made;

h) a list of items for coordination with the RASG and a concise summary of the outcome of related discussions;

i) air navigation deficiencies identified and timelines for mitigation thereof; and

j) the work programme and future actions to be taken by the PIRG.

3.5.3 A technical officer from Headquarters (Air Navigation Bureau) will participate and provide support to the meeting and subsequently arrange for the presentation of reports, in coordination with the Regional Office(s) and chairpersons of the PIRG, to the ANC and Council for review and harmonization.

3.5.4 The final PIRG report will be approved at the end of the meeting. Where the report requires translation, it will be made available within fifteen working days of the meeting closure.

3.5.5 Headquarters will provide feedback to the PIRGs highlighting the actions taken by the ANC and Council related to their previous meeting outcomes.

3.5.6 When a PIRG does not meet during the annual reporting cycle of the consolidated report on PIRGs and RASGs to the Council, the Secretary of the regional group must nevertheless report implementation progress, as well as difficulties experienced, for inclusion in the report.

4. GLOBAL PLANS

4.1 In regard to Global Plans, the PIRG shall:

a) support implementation by States of the *Global Air Navigation Plan* (GANP, Doc 9750) taking into account aspects of the *Global Aviation Safety Plan* (GASP, Doc 10004) and Global Aviation Security Plan (GASeP) by ensuring effective coordination and cooperation between all States and stakeholders;

b) monitor and report the progress on the implementation by States of the GANP, and the regional objectives and priorities;

c) ensure continuous and coherent development of the regional air navigation plan, *Regional Supplementary Procedures* (Doc 7030) and other relevant regional documentation, and propose amendments to reflect the changes in operational requirements in a manner that is harmonized with adjacent regions, consistent with ICAO Standards and Recommended Practises (SARPs), Procedures for Air Navigation Services (PANS) and the GANP;

d) provide feedback on the GANP implementation and propose amendments to the Global Plans as necessary to keep pace with the latest developments and ensure harmonization with regional and national plans;

e) in line with the GANP and regional priorities, identify specific deficiencies in the air navigation field, and propose mitigating actions and timelines to resolve deficiencies; and

f) verify the provision of air navigation facilities and services in accordance with global and regional requirements.

5. REGIONAL ACTIVITIES

5.1 In regard to regional activities, the PIRG shall:

a) serve as a regional cooperative forum that determines regional priorities, develops and maintains the regional air navigation plan and associated work programme based on the GANP and relevant ICAO Provisions;

b) facilitate the development and implementation by States of air navigation systems and services as identified in the regional air navigation plan and Doc 7030;

c) monitor and report on the status of implementation by States of the required air navigation facilities, services and procedures in the region, and identify the associated difficulties and deficiencies to be brought to the attention of the Council;

d) facilitate the development and implementation of corrective action plans by States to resolve identified deficiencies, where necessary;

e) identify and report on regional and emerging air navigation challenges experienced that affect implementation of ICAO global provisions by States and measures undertaken or recommended to effectively address them;

f) facilitate the development and implementation of regional and national air navigation plans by States; and

g) assist Member States with guidance to implement complex aviation systems.

6. PIRG COORDINATION

6.1 In regard to coordination, the PIRG shall:

a) coordinate safety issues with the respective RASG;

b) foster cooperation, information exchange, sharing of experiences and best practices among States and stakeholders;

c) provide a platform for regional coordination and cooperation amongst States and stakeholders for the continuous improvement of air navigation systems in the region with due consideration to harmonization of developments and deployments, intra- and interregional coordination, and interoperability;

d) ensure that all air navigation activities at the regional and sub-regional level are properly coordinated amongst role players to avoid duplication of efforts;

e) identify security, environmental and economic issues that may affect the operation of the air navigation system, and inform ICAO Secretariat accordingly for action; and

f) through the PIRG Secretary, inform the Directors General of Civil Aviation and related civil aviation commission/conferences of PIRG meeting results.

7. INTERREGIONAL COORDINATION

7.1 The PIRG shall:

a) ensure interregional coordination through formal and informal mechanisms, including the participation in meetings established for the purpose of coordinating PIRG and RASG activities, the GANP, regional air navigation plans and regional supplementary procedures; and

b) ensure coordination with informal groups, such as the South Atlantic Group, Informal South Pacific ATS Coordination Group and Informal Pacific ATS Coordination Group, to assure harmonized planning and smooth transition through regional interface areas.

7.2 ICAO Headquarters shall arrange a global coordination meeting between all PIRG and RASG chairpersons and secretaries on a biennial basis.

8. EXPANSION OF TERMS OF REFERENCE

8.1 The Terms of Reference above serve for APANPIRG operations and may be further expanded by APANPIRG, as required, to maintain the flexibility and efficiency of APANPIRG work. Additional terms of reference adopted by APANPIRG must be approved by the President of the Council and be included in the APANPIRG Handbooks as a PIRG specific supplement.

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APANPIRG/31 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
D 31/1 **A & B**	**Proposal for Amendment of APA-CDM/TF TOR**	That, the Terms of Reference (TOR) of Asia/Pacific Airport Collaborative Decision Making Task Force (APA-CDM/TF) be amended as in **Appendix A** to the Report on Agenda Item 3.1.	ICAO RO APAC States and Administrations	State Letter Notified APA-CDM/TF To note the TOR amendment.	29 January 2021 APA-CDM/TF/6 As soon as practicable
C 31/2 **A & B**	**Submission of Wildlife Strike Reports**	That, States are requested to submit wildlife strike reports to ICAO in the format of either ECCAIRS.e5f files or the standard ICAO ECCAIRS Excel-based form available at http://www.icao.int/ibis.	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion.	29 January 2021 As soon as practicable
C 31/3 **A & B**	**Wildlife Hazard Management Training**	That, States recognise the prioritised need for competent and trained personnel in aerodrome wildlife hazard management at regulatory and aerodrome operation levels.	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion.	29 January 2021 As soon as practicable

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/4 **A & B**	**Promotion of a Positive Safety Culture**	That, • States are encouraged to promote a positive safety culture in wildlife hazard management at regulatory and aerodrome operation levels; and • Reporting culture be considered in implementing aerodrome wildlife hazard management programmes.	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion.	29 January 2021 As soon as practicable
C 31/5 **A & B**	**GRF Implementation Action Plan Template**	That, a) The GRF Implementation Action Plan Template contained in **Appendix B** to Report on Agenda Item 3.1 be uploaded to ICAO APAC Website for reference by States / Administrations; and b) States / Administrations are requested to make reference to the GRF Implementation Action Plan Template and submit their own action plans to ICAO APAC Office by **28 February 2021**.	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion.	29 January 2021 As soon as practicable, preferably by 28 February 2021
C 31/6 **A & B**	**Runway Safety Team**	That, States/Administrations to urge operators of aerodromes used for international operations to: a) establish runway safety teams (RSTs) in accordance with PANS-Aerodromes (Doc 9981) and ICAO RST Handbook; and b) participate in the ICAO RST Survey to register their RSTs.	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion.	29 January 2021 As soon as practicable

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/7 **A & B**	**Holding Bay and Multiple Entrance Taxiways**	That, the ICAO HQ be invited to consider to: a) Review Figure 2-2 of ICAO Aerodrome Design Manual (Doc 9157), Part 2 *Taxiways, Aprons and Holding Bays* to tally with SARPs of runway-holding position marking and actual aircraft operations; and b) Review the current SARPs in Annex 14, *Aerodromes* – Volume I, *Aerodrome Design and Operations* to cater for the design of multiple entrance taxiways.	ICAO RO	IOM to HQ Review Figure 2-2 of Doc. 9157, Part 2. Review the current SARPs in Annex 14, *Aerodromes* – Volume I to cater for the design of multiple entrance taxiways.	29 January 2021 31 Dec. 2021

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/8 **A & B**	**Alternative Safety Oversight Framework for Military Aerodromes undertaking Limited Civil International Operations**	That, recognizing: (1) certain military aerodromes in States are undertaking limited civil international operations; (2) certification of such aerodromes by civil aviation authorities may prove difficult; and (3) an alternative safety oversight framework may be appropriate in consideration of the low level of civil international operations at such aerodromes; ICAO HQ is invited to consider establishing an alternative safety oversight framework in lieu of certification for such military aerodromes.	ICAO RO	IOM to HQ Guidance on establishing an alternative safety oversight framework in lieu of certification for such military aerodromes.	29 January 2021 At the earliest possible.
D 31/9 **A & B**	**Amend AAITF Terms of Reference**	That, the amended Terms of Reference for AAITF at **Appendix A to the Report on Agenda Item 3.**2 be adopted.	ICAO RO APAC States and Administrations	State Letter To note the TOR amendment.	29 January 2021 As soon as practicable

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/10 **A & B**	**Review of National Air Navigation Plans (NANPs)**	That, States should review their NANPs in accordance with a whole-of-government approach and the requirements of the Regional Air Navigation Plan to: (1) include airspace user consultation to determine post COVID-19 service provision levels and the related investment and expenditure required, including identifying temporary or permanent service provision modification to reduce operational costs; and (2) seek government support for their Air Navigation Service Providers (ANSPs) during the post-COVID-19 recovery.	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion	29 January 2021 As soon as practicable
C 31/11 **A & B**	**Alphanumeric Call Sign Initiative**	Noting: 1) the extreme safety risks associated with pilot-ATC miscommunication and the number of Category D (ATC Loop Error) Large Height Deviations (LHDs); 2) APANPIRG Conclusion 27/15. ATMSG Conclusions 5-5 and 5-6 regarding the Asia Pacific Alpha Numeric Call-Sign (ANCS) call sign project; and 3) alphanumeric call signs were a well-established call sign confusion mitigation, that: leading Air Navigation Service Providers (ANSPs) and aerodrome operators, in coordination with CANSO and ACI, were urged to consider a trial to identify and overcome any barriers for the implementation of alphanumeric call signs, with a view to developing a project for the Asia/Pacific (APAC) Region.	ICAO RO APAC States and Administrations	State Letter Action in accordance with the Conclusion	29 January 2021 As soon as practicable

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/12 **A & B**	**Target Year of CRV Implementation in APAC Region**	That, set and monitor 2021 as the target for CRV implementation for all ANSPs.	ICAO APAC RO APAC States and Administrations	State Letter Action in accordance with the Conclusion	29 January 2021
C 31/13 **A & B**	**The Revised Regional Strategies on AMS and Datalink**	That, the revised Aeronautical Mobile Service (AMS) Strategy for the Asia/Pacific Region provided in **Appendix A** to the Report on Agenda Item 3.4 and the revised Strategy for Implementation of the Air-Ground Data Link in the Asia/Pac Region provided in **Appendix B** to the Report on Agenda Item 3.4 be adopted.	ICAO APAC RO APAC States and Administrations	Posted on ICAO APAC Website and State letter to notify States Action in accordance with the Conclusion	29 January 2021
C 31/14 **A & B**	**Mode S Forward Fit Equipage in APAC Region**	Regarding fitment of Mode S equipage, That, States/Administrations in APAC Region be strongly encouraged to mandate that registered aircraft with a maximum certified take-off mass exceeding 5 700 kg or having a maximum cruising true airspeed capability greater than 250 knots, with a date of manufacture on or after 1 January 2022 be equipped with Mode S avionics compliant with Enhanced Surveillance (EHS).	ICAO APAC RO APAC States and Administrations	State Letter Action in accordance with the Conclusion	29 January 2021

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/15 **A & B**	**Addressing Human Factor Issues of ATSEP**	That, a) the States are encouraged to make reference and implement the recommendations made out of the IFATSEA study report *Factors adding stress and fatigue to ATSEP* provided in **Appendix R** to the CNS SG/24 Report for pro-active measures; b) States are also encouraged to join the small working group for finding the left-out gaps and in preparing the regional ATSEP human factor guidance material.	ICAO APAC RO APAC States and Administrations	Posted on ICAO APAC Website and State letter to notify States Action in accordance with the Conclusion	29 January 2021
D 31/16 **A & B**	**Updates to Terms of Reference and Work Plan of MET SG**	That, APANPIRG approve the updated terms of reference and work plan document for MET SG at the **Appendix A to the Report on Agenda Item 3.5**.	ICAO	Updated in APANPIRG documentation	Jan 2021
C 31/17 **A & B**	**0.25 Degree WAFS Hazard Data**	That SADIS user States urgently make the necessary systems changes to integrate the new 0.25 degree WAFS hazard data into their SADIS user systems and software	ICAO	State letter	Jan 2021

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/18 **A & B**	**Implementation of IWXXM**	What: That, to support the dissemination by States of the required meteorological information in IWXXM GML form, in accordance with Amendment 79 to Annex 3, Member States/Special Administrative Regions, in particular those which host the designated APAC Regional OPMET Centres (ROCs) and Regional OPMET Databanks (RODBs), that have not already done so, urgently complete the necessary steps including the following: a) For the generation and dissemination of required meteorological information in IWXXM GML form to the local ROC to manage the onward dissemination within the Region, use only IWXXM Version 3 (or a later version); b) To support the exchange of IWXXM formatted data, implement the Air Traffic Services Message Handling System (AMHS) with File Transfer Body Part (FTBP) and the Interpersonal Message Heading Extension (IHE) and include support for AMHS message exchange of a maximum size of 4-MB for IWXXM formatted messages with maximum size of 2-MB for FTBP; c) To support the exchange of the required meteorological information in both IWXXM GML form and traditional alphanumeric code (TAC) form, ensure there is adequate capacity in the operational Aeronautical Fixed Service (AFS) links; d) When ingesting FTBP messages, as a minimum, utilize appropriate malware and anti-virus precautions; and e) For any requirements States have for further technical assistance to achieve compliance with the Annex 3 requirements for disseminating meteorological information in IWXXM GML form and/or differences that exist between the national regulations or practices and the above Annex 3 provisions, inform ICAO via the appropriate channels.	ICAO	State letter	Jan 2021

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/19 **A & B**	**Update of Information in APANPIRG Air Navigation Deficiencies Reporting Form**	That, 1) ICAO to update the APANPIRG Air Navigation Database to reflect the information as presented in **Appendices A to D** to Report on Agenda Item 4. 2) States/Administrations be urged to: a) establish action plan with defined target dates for resolution of deficiencies, update the status on the corrective action taken and report progress in the Reporting Form of Air Navigation Deficiencies identified in ATM and Airspace Safety, AOP, CNS and MET fields as detailed in **Appendices A to D** to the **WP/14**; and b) update contact details of a Focal Point to coordinate actions to resolve the Deficiencies.	ICAO RO APAC States and Administrations	State Letter & update the APANPIRG Air Navigation Database Action in accordance with the Conclusion.	29 January 2021 As soon as practicable

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 31/20 **A & B**	**Evaluation of Combined APANPIRG and RASG-APAC Meeting**	Considering the postponement of the trial combined APANPIRG-RASG-APAC meeting to 2022 or later, the Meeting agreed that: a) The Chairpersons and Vice-chairpersons of APANPIRG and RASG-APAC utilize the considerations contained in **Appendix A to Report on Agenda Item 6** as well any other considerations received for the evaluation of the effectiveness of the trial combined meeting; b) In view of the current COVID-19 pandemic, the evaluation of the effectiveness of the combined meeting be postponed to 2022 or later; and c) A post-meeting survey possibly guided with content contained in **Appendix B to Report on Agenda Item 6** be conducted among the meeting delegates after the combined meeting.	ICAO RO	State Letter	29 January 2021

— END —