



INTERNATIONAL CIVIL AVIATION ORGANIZATION

FINAL REPORT

**REPORT OF THE TWENTY NINTH MEETING OF THE ASIA/PACIFIC
AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP
(APANPIRG/29)**

Bangkok, Thailand, 3 to 5 September 2018

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

TABLE OF CONTENTS

PART I - HISTORY OF THE MEETING

	Page
1.1 Introduction	i-1
1.2 Attendance	i-1
1.3 Opening of the Meeting	i-1
1.4 Officers and Secretariat	i-1
1.5 Agenda of the Meeting	i-1
1.6 Working Arrangements, Language and Documentation	i-2
1.7 Conclusions and Decisions - Definition	i-2
1.8 Terms of Reference of APANPIRG	i-3
List of Conclusions	i-5
List of Decisions	i-7

PART II – REPORT ON AGENDA ITEMS

Agenda Item 1A	Outcome of the First Asia/Pacific Ministerial Conference on Civil Aviation	1A-1
Agenda Item 1B	Follow-up on the Outcome of APANPIRG/28 Meeting	1B-1
1B.1	Review of the action taken by the ANC and the Council on the Report of APANPIRG/28	1B-1
1B.2	Review Status of Implementation of APANPIRG/28 Conclusions and Decisions	1B-1
1B.3	Review Status of Implementation of APANPIRG Outstanding Conclusion and Decisions	1B-1
Agenda Item 1C	Aviation Safety and RASG-APAC Activities	1C-1
Agenda Item 2	Global and Inter Regional Activities	2-1

Agenda Item 3	Performance Framework for Regional Air Navigation Planning and Implementation	
3.0	Regional and National Performance Framework	3.0-1
3.1	AOP	3.1-1
3.2	ATM	3.2-1
3.3	RASMAG	3.3-1
3.4	CNS	3.4-1
3.5	MET	3.5-1
3.6	Other Air Navigation Matters.....	3.6-1
Agenda Item 4	Regional Air Navigation Deficiencies.....	4-1
Agenda Item 5	Future Work Programme	5-1
Agenda Item 6	Any Other Business.....	6-1
6.1	Review of effectiveness of Sub Groups' empowerment to adopt Conclusions and Decisions.....	6.1-1

Appendices

Appendix A to the Report on Agenda Item 1A

Appendix A to the Report on Agenda Item 1B

Appendices A & B to the Report on Agenda Item 3.1

Appendices A to D to the Report on Agenda Item 3.2

Appendices A & B to the Report on Agenda Item 3.4

Appendices A & B to the Report on Agenda Item 3.5

Appendices A to D to the Report on Agenda Item 4

Appendices A & B to the Report on Agenda Item 6

Attachments to the Report

Attachment 1 – List of Participants

Attachment 2 – Opening Speech

Attachment 3 – List of Papers

Attachment 4 – Action Plan

PART I – HISTORY OF THE MEETING

1.1 Introduction

1.1.1 The Twenty Ninth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/29) was held at ICAO APAC Office, Bangkok, Thailand from 3 to 5 September 2018.

1.2 Attendance

1.2.1 The meeting was attended by **173** participants from **27** Member States, **2** Special Administrative Regions of China, **7** International Organizations (CANSO, IATA, IBAC, ICAO, ICCAIA, IFALPA and PASO).

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, 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. Graeme Harris, Director of Civil Aviation, Civil Aviation Authority of New Zealand and Chairman of APANPIRG welcomed the members and delivered the opening address.

1.4 Officers and Secretariat

1.4.1 Mr. Harris, Director of Civil Aviation, Civil Aviation Authority of New Zealand and Chairman of APANPIRG presided over the meeting.

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

1.4.3 The meeting was assisted by Mr. Catalin Radu, Deputy Director, Aviation Safety, Air Navigation Bureau, ICAO Headquarters, Mr. Erwin Lassooij, Chief Programmes Coordination and Implementation (C/PCI), Mr. Manjit Singh, Deputy Regional Director, Mr. Raphael Guillet, Chief of RSO and Regional Officers, ICAO APAC Office.

1.5 Agenda of the Meeting

1.5.1 The meeting adopted the following Agenda:

Agenda Item 1A: Outcome of the First Asia/Pacific Ministerial Conference on Civil Aviation

Agenda Item 1B: Follow-up on the Outcome of APANPIRG/28 Meeting

1B.1: Review of the action taken by the ANC and the Council on the Report of APANPIRG/28

- 1B.2: Review status of implementation of APANPIRG/28 Conclusions and Decisions
- 1B.3: Review status of implementation of APANPIRG outstanding Conclusions and Decisions
- Agenda Item 1C: 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
 - 6.1: Review of effectiveness of Sub Groups' empowerment to adopt conclusions and decisions

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 web site.

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-5 to i-7.

1.8 Terms of Reference of APANPIRG

1.8.1 The Terms of Reference of APANPIRG was approved by the Council of ICAO (6th Meeting of its 171st Session on 27 February 2004) and revised consequent to the Decision of the Council [C-DEC 183/9, March/April 2008 and C-WP/13558, C190/4 on 25 May 2010]. The revised Terms of Reference are:

1. Membership

All ICAO Contracting States, who are service providers in an air navigation region and part of that region's ANP, should be included in the membership of that region's PIRG. Furthermore user States are entitled to participate in any other PIRG Meetings as a non-member. International Organisations recognised by the Council may be invited as necessary to attend PIRG meetings as observers.

2. The Terms of Reference of the Group are:

- a) to ensure continuous and coherent development of the Asia/Pacific Regional Air Navigation Plan and other relevant regional documentation in a manner that is harmonized with adjacent regions, consistent with ICAO SARPs and Global Air Navigation Plan for CNS/ATM Systems (DOC 9750) and reflecting global requirements;
- b) to facilitate the implementation of air navigation systems and services as identified in the Asia/Pacific Regional Air Navigation Plan with due observance to the primacy of air safety, regularity and efficiency; and
- c) to identify and address specific deficiencies in the air navigation field.

3. In order to meet the Terms of Reference, the Group shall:

- a) review, and propose when necessary, the target dates for implementation of facilities, services and procedures to facilitate the coordinated development of the Air Navigation Systems in the Asia/Pacific Region;
- b) assist the ICAO Asia/Pacific Regional Office in fostering the implementation of the Asia/Pacific Regional Air Navigation Plan;
- c) in line with the Global Aviation Safety Plan (GASP), facilitate the conduct of any necessary systems performance monitoring, identify specific deficiencies in the air navigation field, especially in the context of safety, and propose corrective action;
- d) facilitate the development and implementation of action plans by States to resolve identified deficiencies, where necessary;
- e) develop amendment proposals to update the Asia/Pacific Regional Air Navigation Plan to reflect changes in the operational requirements;
- f) monitor implementation of air navigation facilities and services and where necessary, ensure interregional harmonization, taking due account of

organizational aspects, economic issues (including financial aspects, cost/benefit analyses and business case studies) and environmental matters;

- g) examine human resource planning and training issues and propose where necessary human resource development capabilities in the region that are compatible with the Asia/Pacific Regional Air Navigation Plan;
- h) ~~review the Statement of Basic Operational Requirements and Planning Criteria and recommend to the Air Navigation Commission such changes as may be required in the light of new developments in the air navigation field;~~¹
- i) request financial institutions, on a consultative basis as appropriate to provide advice in the planning process;
- j) maintain close cooperation with relevant organizations and State grouping to optimize the use of available expertise and resources;
- k) conduct the above activities in the most efficient manner possible with a minimum of formality and documentation and call meetings of the APANPIRG when deemed necessary to do so; and
- l) coordinate with RASG APAC on safety issues.

¹ With regard to item h) of the APANPIRG Terms of Reference secretariat informed that AN 186-6 confirmed that the BORPC was no longer used. The Council on 18th June 2014 approved the format of the new e ANP without a BORPC. Therefore, the need to review the BORPC was no longer required as part of the TOR of PIRGs.

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List of Conclusions

Conclusion 29/1	– Declaration on Asia/Pacific Ministerial Conference on Civil Aviation
Conclusion 29/2	– Safety and Air Navigation overview – implementation
Conclusion 29/3	– Safety Management Implementation support
Conclusion 29/4	– Implementation support for Global Reporting Format (GRF) for Runway Surface Conditions
Conclusion 29/5	– Asia Pacific Regional Guidance on Requirements for the Design and Operations of Water Aerodromes for Seaplane Operations
Conclusion 29/6	– Airports Climate Change Adaptation Measures
Conclusion 29/7	– Transition Planning for RNP APCH CHART Identification from RNAV to RNP
Conclusion 29/8	– Proposal for amendment to PANS-ATM (Doc4444) on ADS-B related Phraseology
Conclusion 29/9	– Procedures for Ballistic Launch/Space Re-entry Management
Conclusion 29/10	– Minimizing the Impact of Non-ICAO Procedures and Requirements for Military Activities Affecting Civil Aviation
Conclusion 29/13	– ICAO Action to Provide Support and Guidance Material to Facilitate AIS – AIM Transition
Conclusion 29/14	– GADSS Aircraft Tracking Requirement
Conclusion 29/15	– SAR and GADSS in the GANP
Conclusion 29/16	– Using IPS Routers between BBIS Administrations
Conclusion 29/17	– Revised Strategy for Implementation of Communication systems to support Air Navigation Service
Conclusion 29/18	– Support allocation of radio spectrum for space based VHF communications
Conclusion 29/19	– PBN-IN-A-PAGE (Version 2.0)
Conclusion 29/20	– Ground Based GNSS Status Monitoring
Conclusion 29/21	– Revised ADS-B Version 2 ADS-B Out Forward Fit Equipage
Conclusion 29/22	– Survey on Surveillance and DCPC VHF Coverage
Conclusion 29/25	– APAC Regional Guidance for MET Information Supporting ATM

Conclusion 29/27	–	Update of information in APANPIRG Air Navigation Deficiencies Reporting Form
Conclusion 29/28	–	Empowerment to adopt Conclusions and Decisions on purely technical/operational matters by APANPIRG's Sub Groups
Conclusion 29/29	–	State Handling of ICAO Correspondence
Conclusion 29/30	–	State Actions on Air Navigation Deficiency

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List of Decisions

Decision 29/11	–	AIRARD/TF Terms of Reference
Decision 29/12	–	Revised APUAS/TF Terms of Reference
Decision 29/23	–	Removal of deficiencies Index No. AP-MET-09 and AP-MET-11 from the APANPIRG (open) list
Decision 29/24	–	Removal of deficiency Index No. AP-MET-12 from the APANPIRG (open) list
Decision 29/26	–	Updated terms of reference of the MET SG (including work plan)
Decision 29/31	–	APANPIRG Actions on Air Navigation Deficiency

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Agenda Item 1A: Outcome of the First Asia/Pacific Ministerial Conference on Civil Aviation

Outcome of the First Asia/Pacific Ministerial Conference on Civil Aviation (WP/02)

1A.1 The meeting was informed about the outcomes of the First Asia/Pacific Ministerial Conference on Civil Aviation (APACMC), which was held in Beijing, China from 31 January to 1 February 2018. The Report of the Conference is available at:
<https://www.icao.int/APAC/Meetings/Pages/2018-APACMC.aspx>.

1A.2 The meeting noted that the *Declaration on Asia/Pacific Ministerial Conference on Civil Aviation* was unanimously agreed by all Delegations and endorsed by the Conference. The Declaration was named as Beijing Declaration and provided in **Appendix A** to the Report on Agenda Item 1A.

1A.3 The meeting also noted that India proposed to hold the next Asia/Pacific Ministerial Conference on Civil Aviation in 2020 and graciously offered to host it.

Follow-up action by the Secretariat

1A.4 As follow-up action, the Secretariat will review the Beijing Declaration objectives in 2020 in order to reflect, as required, any resolutions agreed to by the ICAO Assembly in 2019, including those on the endorsement of the new versions of the Global Aviation Safety Plan (GASP) and Global Air Navigation Plan (GANP), and initiate the organization of the Second Asia/Pacific Ministerial Conference on Civil Aviation in 2020 or thereafter.

1A.5 Also, the Secretariat will make efforts to enable the continuous monitoring and annual reporting of the commitments in the *Beijing Declaration* through the Regional Aviation Safety Group of Asia and the Pacific Region (RASG-APAC) and the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPRIG) establishing relevant goals and targets to monitor progress towards the fulfilment of the commitments, as follows:

- RASG-APAC and Asia Pacific Regional Aviation Safety Team (APRAST): on aviation safety, accident investigation and human resources development; and
- APANPIRG and its contributory bodies: on air navigation services and human resources development.

1A.6 The meeting reviewed the *Beijing Declaration* and follow up action proposed by the Secretariat and formulated the following Conclusion:

Conclusion APANPIRG/29/1: Declaration on Asia/Pacific Ministerial Conference on Civil Aviation			
What: That, a) States/Administrations be urged to allocate necessary resources to meet the <i>Beijing Declaration Targets and Commitments</i> on Aviation Safety, Air Navigation Services, Accident Investigation and Human Resources Development; b) APANPIRG Contributory Bodies to assist and monitor the implementation of related aspects of Beijing Declaration and report progress to the annual APAC DGCA Conference; and c) Secretariat to review the Beijing Declaration objectives in 2020 in order to reflect, as required, any resolutions agreed to by the ICAO Assembly in 2019, including those on the endorsement of the new versions of the Global Aviation Safety Plan (GASP) and Global Air Navigation Plan (GANP), and initiate the organization of the Second Asia/Pacific Ministerial Conference on Civil Aviation in 2020 or thereafter.		Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical	
Why: To meet the committed goals and targets of the Beijing Declaration.		Follow-up: ☒ Required from States	
When: 5-Sep-18		Status: Adopted by PIRG	
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:			

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Agenda Item 1B: Follow-up on the Outcome of APANPIRG/28 Meeting

Review of the Actions of the Air Navigation Commission (ANC) on the Report of the APANPIRG/28 (WP/03)

1B.1 The Meeting noted that the ANC, on 8 November 2017, reviewed the Report of the APANPIRG/28 Meeting (Bangkok, 11 to 14 September 2017). The Attachment 'A' to the APANPIRG/29 Working Paper/03 presented the action taken by the ANC on the Conclusions and Decisions of APANPIRG/28 based on the recommendations of the Working Group of the Whole for Strategic Review and Planning (WG/SRP).

1B.2 The Paper invited meeting to note the action taken by the Commission on the APANPIRG/28 Report and include the follow-up actions in the work programme of APANPIRG as necessary.

Review of the Action Taken by the ANC and the Council on the Consolidated Annual Report on APANPIRG/28 (WP/04)

1B.3 The Meeting noted that the Council reviewed a consolidated annual report on Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs) covering the period from April 2017 to March 2018 presented jointly by ANC and the Air Navigation Bureau (ANB). The annual report serves as the main tool for the ANC to evaluate implementation progress in the regions and also common challenges faced by the regions

1B.4 The Meeting also noted that the ANC had acknowledged with interest the importance of the APAC Ministerial Conference on Civil Aviation that took place and had agreed that this was an example of an event during which senior government officials could discuss both safety and air navigation issues and build political will to include aviation in the national development plans.

1B.5 The Paper invited the meeting to take required action on the Council Decisions.

Review of Status of Implementation of APANPIRG/28 Conclusions and Decisions (WP/05)

1B.6 The Meeting reviewed the action taken by States/ICAO and the progress made on the APANPIRG/28 Conclusions and Decisions.

1B.7 The Meeting noted that out of the 31 items listed; action has been taken to close/complete 22 Conclusions and 6 Decisions. Action on the remaining 3 Conclusions [19, 25 & 28] was ongoing. The updated status on implementation of APANPIRG/28 Conclusions and Decisions is provided in **Appendix A** to the Report on Agenda Item 1B.

Review of Status of Implementation of APANPIRG Outstanding Conclusions and Decisions (WP/06)

1B.8 The Meeting reviewed the action taken by States/ICAO and progress made on the APANPIRG Outstanding Conclusions and Decisions up to its Twenty Seventh Meeting.

1B.9 APANPIRG noted that out of the 3 outstanding Conclusions [26/50, 27/12 & 27/52] up to **APANPIRG/27**, the follow-up actions taken by States and ICAO on all three Conclusions were completed/closed.

1B.10 The Meeting acknowledged that significant progress had been made in completing required action on the Outstanding APANPIRG Conclusions and Decisions. **Appendix A** to APANPIRG/29 Working Paper/04 presented the updated status.

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Agenda Item 1C: Aviation Safety and RASG APAC Activities

Safety and Air Navigation overview – implementation (Flimsy 1)

1C.1 Flimsy 1 provided information on a different approach for the implementation, with the aim of optimizing these efforts. It was emphasized that the environment in which aviation currently exists was rapidly changing, not only due to an increased volume of traffic, but also with new entrants in aviation (drones, FL 600+, etc.). As a result, a new vision was required through careful planning for the aviation system as whole. This vision needed to be materialized through a mechanism of prioritization and needs analysis, defining tasks from concepts of operation to implementation in a project oriented manner, with appropriate performance measurement throughout the duration of the project.

1C.2 In order to obtain political will for aviation projects and obtain better funding, it was emphasized that ICAO projects should be linked to the United Nations Sustainable Development Goals (UNSDGs).

1C.3 After deliberation and discussion on ICAO presentation the meeting agreed on the following Conclusion:

Conclusion APANPIRG/29/2: Safety and Air Navigation overview – implementation			
What: That, given the fast growth in aviation and the advent of new entrants, it is imperative that: a) ICAO through Regional and national planning and implementation be prioritized and seamlessly linked to Global Planning; b) a project management structure be required as a vehicle to address the process from planning to implementation; and c) in order to elevate political will and increase opportunities for funding, projects be linked to the UNSDGs and the National Development plans.		Expected impact: ☒ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical	
Why: Due to the increasing volume of traffic and new stakeholders in aviation.		Follow-up: ☒ Required from States	
When: 5-Sep-18		Status: Adopted by PIRG	
Who: ☐ Sub groups ☒ APAC States ☒ ICAO APAC RO ☒ ICAO HQ ☐ Other:			

Report of the Fifth Coordination Meeting between APANPIRG and RASG-APAC (WP/07)

1C.4 APANPIRG/29 meeting reviewed the Report of the Fifth APANPIRG and RASG–APAC Coordination Meeting held in Bangkok, Thailand on 18 July 2018. The meeting noted the outcomes of the meeting which were summarized in the Attachment to Working Paper 7.

1C.5 The meeting with interest noted that APANPIRG would lead group responsibility with regard to *runway safety* and RASG- APAC with respect to *English language proficiency*.

RASG/7 and APRAST/11 – 12 Meeting Outcomes (WP/08)

1C.6 APANPIRG/29 meeting noted the activities undertaken by the RASG-APAC and APRAST in 2017/2018. The meeting also noted outcomes of APRAST/11 and 12 meetings held from 20 to 24 November 2017 and 28 May to 1 June 2018 respectively in Bangkok, Thailand and RASG-APAC/7 meeting held on 3 to 5 July 2017 in Bangkok.

CANSO Standard of Excellence in SMS and SEANS-Safety (WP/18)

1C.7 APANPIRG/29 was informed of the CANSO Standard of Excellence in Safety Management Systems (SoE in SMS) which is a planning tool that emphasizes the phased, step-by-step implementation of an SMS from the most basic informal arrangements to an optimized system.

1C.8 The meeting was also informed about the CANSO Standard of Excellence in ANS – Safety (SEANS-Safety) programme which was endorsed at the ICAO 39th Assembly, and is recognized as an industry-led independent assessment tool for implementing safety management systems in the ANSPs of CANSO member States.

1C.9 The meeting noted that the CANSO SoE in SMS and its SEANS-Safety programme will help uplift the safety levels of ANSPs by providing them with guidance on SMS implementation and an objective and standardised means of assessing and demonstrating their safety management capabilities to their regulators and ICAO.

Enhancing Support for the Implementation of Effective Safety Management (WP/27)

1C.10 APANPIRG/29 was informed of the tasks currently in progress and completed by ICAO to enhance the support for the implementation of State Safety Programmes (SSPs) and Safety Management Systems (SMS) subsequent to the adoption of Amendment 1 to Annex 19.

1C.11 The meeting noted that the tasks that included, a revision to the Safety Management Manual (SMM) (Doc 9859); the development of an ICAO Safety Management Implementation website with examples to complement the 4th edition of the SMM; updated SSP tools; an update to the ICAO Safety Management Training Programme; and ICAO SSP implementation promotional activities. The various updated tools and training would be soon available to States. The APAC Office would facilitate and promote use of these materials and tools.

1C.12 The meeting was informed that recognizing the challenges faced in implementing SSP and Safety Management System (SMS) “commensurate with the size and complexity” of each organization and the wide range of service providers addressed by Annex 19, the ICAO Safety Management Implementation website as a complement to the 4th edition of the Safety Management Manual would include some examples currently found in the third edition of SMM (updated) and provide a mechanism for the sharing of multiple tools and examples. This will emphasize the need for an SSP or an SMS to be tailored to the specific needs of each State and service provider.

1C.13 It was indicated that currently 14 nominations for SMI focal points had been received. Currently ten examples were received from the APAC Region so far.

1C.14 The APANPIRG/29 adopted the following Conclusion:

Conclusion APANPIRG/29/3 : Safety Management Implementation support			
What: That, a) the nominated focal points submit practical implementation examples and tools using the secure portal; and b) States are encouraged to make use of the updated tools and training once made available.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: For the sharing of multiple tools and examples in support of effective safety management implementation.		Follow-up: ☒ Required from States	
When: 5-Sep-18		Status: Adopted by PIRG	
Who: ☐ Sub groups ☒ APAC States ☒ ICAO APAC RO ☒ ICAO HQ ☐ Other:			

Agenda Item 2: Global and Inter Regional Activities

Potential of Space-based ADS-B to improve Global Aviation Safety (WP/19)

2.1.1 The terrestrial ATC surveillance solutions are limited to the airspace where they are able to provide coverage, while Space-based ADS-B can cover almost all airspace of each FIR. ICCAIA informed the meeting that the Space-Based ADS-B service will become operational in late 2018 which would enable significant safety benefits in airspace without continuous and seamless surveillance. The service is expected to be certificated in early 2019 by EASA. The safety benefits of the system were highlighted in the presentation including improved Flight Information Region (FIR) boundary safety, support for GADSS & Search and Rescue, improved contingency backup to terrestrial surveillance etc. The Space-based ADS-B will also bring capacity improvements including the reduction in separation standards using CPDLC and the Space-based ADS-B.

2.1.2 Air Navigation Service Providers (ANSPs) were invited to be aware that the service can be readily integrated into Air Traffic Control (ATC) automation systems that already process ADS-B. The States/Administrations were also encouraged to consider implementation of this technology to improve safety and efficiency in airspace currently without continuous and seamless surveillance. While supporting the proposal, Singapore also proposed to consider a solution for associated space based VHF communication. The meeting further noted that the separation standard using the technology and CPDLC was being developed by SAS. Panel. It was also informed that ICAO, assisted by ICCAIA was working on the implementation guidance for using spaced based ADS-B. There is an agenda item on space based ADS-B in the planned surveillance workshop scheduled for 5-6 November 2018 in Bangkok, Thailand (IP/15 refers).

Implementation Support for the Global Reporting Format for Runway Surface Conditions (WP/23)

2.1.3 ICAO presented WP/23, which briefly introduced the Global Reporting Format (GRF) for runway surface conditions, which would become applicable on 5 November 2020.

2.1.4 A key aspect of the GRF would be the scope of its impact, including multiple ICAO provisions (Annexes 14, 15, 3, 6 and 8; Documents 9981, 10064, 9157 and 4444; Circular 329), affecting multiple stakeholders and States.

2.1.5 To help facilitate implementation ICAO was planning a global symposium jointly with ACI World, which would take place during 26-28 March 2019 in Montreal. This symposium would aim to ensure awareness and knowledge of the GRF in preparation for its deployment. It would also address training needs and resources as well as provide a forum to share implementation experiences. The intention was that the global symposium would be reinforced through the organisation of seminars at a regional level, the organisation of which should be led by respective States and regional offices of concerned international organisations.

2.1.6 The meeting agreed to the following Conclusion:

Conclusion APANPIRG/29/4: Implementation support for Global Reporting Format (GRF) for Runway Surface Conditions			
What: That, in the interest of a widespread and harmonised implementation: a) States and concerned aviation stakeholders are encouraged to actively participate in the Global GRF Symposium; and b) States are encouraged to host regional GRF seminars.		Expected impact: ☒ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical	
Why: To ensure awareness and knowledge of the GRF in preparation for its deployment.		Follow-up: ☒ Required from States	
When: 5-Sep-18		Status: Adopted by PIRG	
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☒ ICAO HQ ☒ Other: Aviation Stakeholders			

PBN Approach Charts – Regional Plan for Transition from RNAV to RNP (WP/24)

2.1.7 WP/24 presented the final text of Circular 353, outlining the transition plan for the change from RNAV (GNSS) to RNP identification for PBN approaches. With the publication of this guidance, States are urged to begin the necessary work, as outlined in the Circular, to assist with the development of the regional plan to amend these charts. The APANPIRG agreed that the text of this Circular should be used to assist States in drafting their State transition plans, and that a regional plan should be developed for the conversion of all PBN approach charts to the new format identification and communicated to ICAO HQ by June 2019.

2.1.8 APANPIRG noted that this was another example of an implementation process that had not been ideal, with the guidance material being released part way through the transition period instead of at the applicability of the SARP. It was recognised that the APAC Region had already commenced work on State engagement and preparation for a Regional Transition Plan, as, detailed in the ATM/SG Report under Agenda Item 3.2.

Implementation Support for the New SID/STAR Phraseology (WP/25)

2.1.9 The meeting was reminded of the 2016 amendment to PANS-ATM, which intended to enhance comprehensibility of the SID/STAR phraseology, improve the consistency of procedures and hence ensure understanding between flight crews and air traffic controllers.

2.1.10 It had been noted that following the 10 November 2016, applicability date, some States (and Air Navigation Service Providers (ANSPs)) had reported challenges with the implementation of the procedures. The consequent irregular implementation was a source of confusion for flight crews, resulting in an increased workload for air traffic controllers.

2.1.11 IATA commented that ICAO's Standards and Recommended Practices (SARPs) development process had not been working effectively. While acknowledging that greater emphasis on implementation issues was necessary, the ICAO Regional Office also suggested that a justification process was necessary at the earliest stages, in coordination with the ICAO regions, as some SARPs should not have been progressed beyond this step, or the true implementation issues would have been better identified. ICAO indicated that a seamless implementation process (PCI process) had been developed to avoid this type of issue in the future.

2.1.12 ICAO HQ stated that it was working to ensure a wider harmonised implementation of the SID/STAR provisions through the identification of the challenges, the sharing of experience, and a targeted support to improve awareness. This activity was being undertaken with the active support and contribution of industry through the ICAO SID STAR Implementation Support Team (ISSIST).

2.1.13 The meeting noted that the SID/STAR phraseology implementation had been the subject of discussion at APANPIRG, its ATM sub-Group and other relevant Regional bodies since early 2017. The ATM Sub-Group had developed a Transition Strategy for the Asia/Pacific Region, as detailed in the ATM/SG Report under Agenda Item 3.2.

2.1.14 The meeting encouraged States to request support from the ISSIST through regional offices when needed.

Risk Assessment for Civil Aircraft Operations over or near Conflict Zones –
Comprehensive Guidance Material and Practices for States, Operators, and ANSPs
(WP/26)

2.1.15 The meeting noted that in response to the downing of Flight MH17 on 17 July 2014, ICAO took several initiatives against the use of weapons against a civil aircraft and to address issues related to the safety and security of civil aircraft in airspace flying over or near conflict zones. One of these initiatives was the publication of the document *Civil Aircraft Operations Over Conflict Zones* (Restricted). This document covered the risks from both deliberate and unintentional attacks on civil aircraft and was first published in November 2016 and reissued in April 2017 with a document number (Doc 10084 - Restricted).

2.1.16 The ANB and the ATB had combined their efforts in a joint project, resulting in the second edition of Doc 10084 under the new title *Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones* (non-restricted). Doc 10084 had been further amended to expand the advice for States, aircraft operators and other service providers regarding the risks from surface-to-air missiles (SAMs) and key risk factors to be considered for their own risk assessments. The enhanced guidance material in the revised manual was based on existing ICAO provisions and industry practices.

2.1.17 The second edition of Doc 10084 was an important milestone for ICAO. Part of the work programme on conflict zones was associated with a number of related future amendments of ICAO provisions. ANB had taken the project as a pilot within its new structure of project management; an important goal was to combine the implementation of the associated work in progress of security and safety provisions at the same time, which are currently separated, thereby improving efficiency.

2.1.18 ICAO promoted the document through information papers, (electronic) flyers and/or presentations to appropriate venues and the Regional Offices as part of the implementation plan for 2018. With the feedback received from the Regional Offices and venues, ICAO could conduct workshops or training exercises, depending on the needs identified.

2.1.19 The ICAO Regional Offices, States concerned, and stakeholders were requested to study the content of the manual and to address areas for improvement for their regional plans. Meanwhile monitoring in their region was necessary to determine how States, operators, ANSPs, and other industry parties implemented the provisions in the manual, using the guidance extracted from the manual. Then the results could be reported before 01 November 2018, using the template as presented in **Appendix C of WP/26**.

Establishing the Aviation Community Operational Resilient Network Services (ACORNS) (WP/28)

2.1.20 Through the paper, the USA introduced a new concept - the Aviation Community Operational Resilient Network Services (ACORNS) and highlighted the necessity to establish a global trust framework for ACORNS in order to increase the efficiency and capacity of the international aviation system.

2.1.21 States have concerns about individual and regional information security. Without an approach for global, interoperable, resilient and secure network services, the promise to increase the efficiency and capacity of the international aviation system documented in the GANP would not be realized. ACORNS will be a foundational global framework built with cybersecurity and interoperability as part of its core concepts, ensuring an infrastructure that is ready for the integration of future Air Traffic Management (ATM) concepts and new entrants. The infrastructure would also be ready to adopt improved cybersecurity policies as new threats emerge. Any user, system, application, or service connected to ACORNS will need to perform mutual authentication to ensure that the information exchange can be trusted. In order to do so and ensure integrity of information, a global trust framework for ACORNS must be established.

2.1.22 APANPIRG member states therefore were invited to be aware of the need for a global trust framework.

Promotion of a Global System-Wide Information Management Framework (WP/29)

2.1.23 Through the paper, the USA highlighted the benefits being gained from implementation of SWIM and the need for a global SWIM framework. Global SWIM framework will overcome the present-day information exchange system constraints (point-to-point or application-to-application, limited information, low speed, etc.) and provide flexible information services at different levels by establishment of common set of performance-based standards, policies and processes for SWIM information, information services and technical infrastructure. APANPIRG member States therefore were urged to work together to promote the establishment of global SWIM frameworks and global interconnectivity.

Promotion of Cyber Resilience through Global Awareness and Regional Exercises (IP/02)

2.1.24 Based on an effort undertook to identify cybersecurity risks and develop mitigation strategies across the aviation ecosystem that may impact safety and cause disruption to the operation of the National Airspace System (NAS), the FAA proposes a model of regional cyber tabletop exercises utilizing facilitated discussion of scenarios designed to be an open, thought-provoking exchange of ideas on various issues regarding a hypothetical, simulated cyber incident, which can be used to enhance general awareness, validate current plans and procedures, and assess the systems and activities that lie within the framework of cyber incident response and recovery.

UAS Integration Pilot Program (IP/03)

2.1.25 The USA provided information about the Unmanned Aircraft Systems (UAS) Integration Pilot Programme, which was intended to allow for the safe testing and validation of advanced UAS operations in partnership in select jurisdictions across the United States under the Integration Pilot Program (IPP). In developing the IPP, it was recognized that UAS integration would require private sector cooperation and the involvement of all levels of government in a national effort to develop and enforce regulations on UAS operations.

Areas of interest for the United States at ICAO'S 13th Air Navigation Conference (IP14)

2.1.26 The USA provided an overview of areas of interest to the United States for the 13th ICAO Air Navigation Conference. These included UAS and Integration of the Remotely Piloted Aircraft Systems (RPAS) work program, certification of supersonic aircraft, harmonization of cyber security concepts, the GANP and Basic Building Blocks, provision of Aeronautical Meteorological information in SWIM-compliant formats and global SWIM, Search and Rescue (SAR) and Global Aeronautical Distress and Safety System (GADSS), and the Global Aviation Safety Plan (GASP).

ICAO Workshop on Aeronautical Surveillance Systems Thailand 05-06 November 2018 (IP/15)

2.1.27 A workshop on Aeronautical Surveillance Systems will be jointly hosted by AEROTHAI and ICAO APAC Regional Office with the support of ICAO Surveillance Panel members. The event scheduled from 05 to 06 November 2018 will provide a unique opportunity to learn about the latest developments of surveillance solutions. States were encouraged to take advantage of this forum and to plan for attendance.

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

3.0: Regional and National Performance Framework

Status Upgrade of the Long-Term Vision for the Future Air Traffic Systems of Japan (CARATS) (IP/04)

3.0.1 IP/4 provided 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, which describes goals aimed at for 2025, directions of renovation, etc. CARATS sets goals like improvement of safety, correspondence to the growth in global air traffic demand, improvement of user-friendliness, improvement of operational efficiency, etc.

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

3.1 AOP

Review of the Second Meeting of Aerodrome Operations and Planning (AOP)
Sup Group (WP/09)

History of the Meeting

3.1.1 The Second Meeting of the AOP Sub Group (AOP/SG/2) was held from 27 to 29 June 2018 at APAC Office in Bangkok.

3.1.2 Based on the outcome of discussions, the AOP/SG/2 adopted 1 Conclusion and 4 Decisions that were of a technical or purely operational nature. The AOP/SG/2 formulated 2 Draft Conclusions for further consideration by APANPIRG/29.

*Report of the Airport Collaborative Decision-Making (A-CDM) Seminar and the
Second Meeting of the Asia Pacific Airport Collaborative Decision Making Task
Force (APA-CDM/TF/2)*

3.1.3 AOP/SG/2 reviewed the Report of the Airport Collaborative Decision-Making (A-CDM) Seminar and the Second Meeting of the Asia Pacific Airport Collaborative Decision Making Task Force (APA-CDM/TF/2) held in Hong Kong China from 29 November to 1 December 2017.

3.1.4 The AOP/SG/2 supported the development of a Regional A-CDM Implementation Plan to foster harmonized and interoperable A-CDM implementation in the Asia/Pacific Region.

*Report of the Third Meeting of the Water Aerodromes Small Working Group
(WASWG/3)*

3.1.5 The Third Meeting of the Water Aerodromes Small Working Group (WASWG/3) was held in Hulhulé, Maldives from 6 to 8 February 2018. The WASWG/3 focused their discussion on the finalization of the document *Asia Pacific Regional Guidance on Requirements for the design and operations of water aerodromes for seaplane operations*.

3.1.6 Since WASWG had completed all tasks as per its TOR, the APANPIRG/29 adopted the following Conclusion formulated by the WASWG/3 and endorsed by AOP/SG/2:

Conclusion APANPIRG/29/5: Asia Pacific Regional Guidance on Requirements for the Design and Operations of Water Aerodromes for Seaplane Operations			
What:	That:	Expected impact:	
	1) the <i>Asia Pacific Regional Guidance on Requirements for the Design and Operations of Water Aerodromes for Seaplane Operations</i> placed in Appendix A to the Report on Agenda Item 3.1 is adopted as regional policy and made available on the ICAO APAC website; and	☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
	2) the WASWG had completed all tasks as per its TOR and be dissolved.		
Why:	1) To provide regional guidance material on water aerodromes; and 2) To dissolve the WASWG.	Follow-up:	☐ Required from States
When:	September 2018	Status:	Adopted by PIRG
Who:	☐ Sub groups ☒ APAC States ☒ ICAO APAC RO ☒ ICAO HQ ☐ Other:		

Report of the First Meeting of the Aerodrome Operational Personnel Competency Small Working Group (AOPC SWG/1)

3.1.7 The First Meeting of the Aerodrome Operations Personnel Competency Small Working Group (AOPC SWG/1) was held in Bangkok, Thailand from 26 to 28 February 2018.

3.1.8 The AOPC SWG/1 developed a draft template of the Aerodrome Operations Personnel Competency Matrix and members of the Working Group assigned to specific task(s) would use this template to develop matrices.

3.1.9 The AOP/SG/2 agreed to amend the TOR extending the timeframe to complete the tasks assigned to the AOPC SWG until 30 September 2019. The AOP/SG/2 adopted the following Decision formulated by the AOPC SWG/1:

Decision AOP/SG/2-2: Amendment to TOR of the Small Working Group to Develop Guidance on Aerodrome Operations Personnel Competency (AOPC SWG)

ICAO Universal Safety Oversight Audit Programme – CMA and AGA Findings

3.1.10 The AOP/SG/2 noted the Effective Implementation (EI) results taken from the USOAP CMA online framework and the common AGA findings identified by the USOAP in the APAC Region. APAC average EI in AGA area was 57.87% compared to the global average of 59.50% as of 09 June 2018.

Status of Implementation of Requirements for Certification of Aerodromes in the APAC Region

3.1.11 The AOP/SG/2 reviewed the updated status of certified international aerodromes in the APAC Region and urged the concerned States to provide the ICAO APAC Office the information on implementation of ICAO requirements on certification of aerodromes to update the relevant information, such as, the updated status on regulatory framework, progress of aerodrome certification and SMS implementation.

3.1.12 The AOP/SG/2 noted a progress achieved in 2018 in certification of aerodromes (CE 6 areas) compare to year 2017 as shown in **Table 3.1-1**.

Table 3.1-1: ICAO USOAP results of June 2018 and May 2017 in certification of aerodromes (CE-6)

Year	USOAP Results	RASG-APAC States Average EI (%)	States with EI less than 60% of GASP Target
June 2018	Aerodrome Certification [CE – 6]	60.45	19 States: Bhutan, Cambodia, Fiji, India, Lao PDR, Malaysia, Marshall Islands, Micronesia (Federal States of), Myanmar, Nauru, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Thailand, Timor-Leste, Tonga and Vanuatu
May 2017	Aerodrome Certification [CE – 6]	59.78	21 States: Bhutan, Cambodia, Fiji, India, Indonesia, Lao PDR, Malaysia, Marshall Islands, Micronesia (Federal States of), Myanmar, Nauru, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Thailand, Timor-Leste, Tonga, Vanuatu and Vietnam

3.1.13 The AOP/SG/2 further noted that approximately 20% of aerodromes used for international operations (aerodromes listed in Regional Air Navigation Plan) in Asia and Pacific Regions were yet to be certified. The meeting urged States to take necessary measures, including the allocation of adequate resources in order that States could achieve *2020 target* to complete the certification process in accordance with the commitment of the *Beijing Declaration*. The AOP/SG/2 urged Member States, who had not fully met the requirements for certification of aerodromes, to develop action plan and submit it to the APAC Office before APANPIRG/29 Meeting scheduled on 3 – 5 September 2018.

3.1.14 The State letter requesting information on international aerodromes that are yet to be certified, States' action plan on certification of aerodromes to meet the 2020 target of *Beijing Declaration* and assistance required from ICAO or other entities to support States for implementation of State's action plan was sent out by ICAO APAC Office to the concerned States on 10 August 2018.

3.1.15 The AOP/SG/2 also noted that the majority of the APAC States have not published in their national AIP the status of certified aerodromes as per ICAO Annexes 14 and 15 requirements and urged States to do so.

3.1.16 The AOP/SG/2 urged States to provide information related to those aerodromes used for international operations 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 Asia Pacific Air Navigation Plans Volume I and Volume II.

ICAO Initiatives for Assistance to States in AGA Area

3.1.17 The AOP/SG/2 noted AGA technical assistance missions conducted to APAC States from 2015 to 2018 under ICAO APAC Combined Action Team (CAT), ICAO Programme for Aviation Volunteers (IPAV) and International Financial Facility for Aviation Safety (IFFAS) initiatives as provided in **Table 3.1-2** below:

Table 3.1-2: AGA Technical Assistance Missions Conducted to APAC States

2015	2016	2017	2018
ICAO APAC CAT			
	Bangladesh	Bangladesh (Follow-up CAT mission)	
	Cambodia	Indonesia (Follow-up CAT mission)	
	Indonesia	Myanmar (Follow-up CAT mission)	
	Myanmar	Fiji	
	Philippines		
	Papua New Guinea		
	Solomon Islands		
	Thailand		
	Tonga		
IPAV			
		Cambodia	Solomon Islands
		Fiji	
		Timor-Leste	
IFFAS			
Samoa		Solomon Islands	
Solomon Islands		Tonga	
Tonga		Solomon Islands	

3.1.18 The AOP/SG/2 further noted that as a result of continuous efforts in improving USOAP CMA EI by States and technical assistance extended to Asia Pacific States through various ICAO led initiatives there was an improvement in overall APAC States' average AGA EI, which was 57.87% as of June 2018 compare to 56.29% as of May 2017. Furthermore, the following improvements in EI have been noted pre and post ICVM of the audited States as shown in **Table 3.1-3**:

Table 3.1-3: USOAP CMA EI in AGA before and after ICVM

S. No		EI as of March 2016 [Pre ICVM]	EI as of June 2018 [Post ICVM]
1	Bangladesh	54.68	65.44
2	Indonesia	44.90	72.73
3	Papua New Guinea	61.59	68.15
4	Philippines	38.13	48.89

3.1.19 The AOP/SG/2 urged States having AGA experts to volunteer their services to the ICAO APAC CAT initiative, and States with low USOAP EI in AGA to request ICAO for the APAC CAT and IPAV assistance. The meeting also urged International Organization(s) to collaborate with ICAO in capacity building programmes.

Current Development and New Initiatives in the Area of Aerodromes

3.1.20 The AOP/SG/2 noted that the Amendment 14 to Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations* and Amendment 8 to Annex 14 Volume II — *Heliports* were adopted by the Council at the sixth meeting of its 213th Session on 9 March 2018, which would become effective on 16 July 2018 and applicable on 8 November 2018. State letters Ref.: AN 4/1.2.27-18/23 (Amendment 14 to Annex 14, Volume I) and AN 4/16.9-18/24 (Amendment 8 to Annex 14 Volume II) dated 29 March 2018 could be found at ICAO secure portal <https://portal.icao.int/icao-net/SL2018C/023e.pdf>.

3.1.21 The AOP/SG/2 also noted that ICAO had developed the Second Edition of Doc 9157, *Aerodrome Design Manual (ADM) Part 5 Electrical Systems* and Amendment 2 to Doc 9157 *ADM Part 1 - Runway* and Amendment 1 to Doc 9157 *ADM Part 2 – Taxiway, Aprons and Holding Bays* in support of Amendment 14 to Annex 14 Volume I.

Aerodrome Operator Interaction with the State Aeronautical Information Service

3.1.22 The AOP/SG/2 was briefed on the necessity for close engagement between all originators of aeronautical information or data, including aerodrome authorities, and the State Aeronautical Information Service. Information was provided on the provisions of Annex 14, and of Annex 15 *Aeronautical Information Services (AIS)*, particularly relating to Aeronautical Information Regulation and Control (AIRAC), and to the quality management of aeronautical information. It was noted that the Standards and Recommended Practices (SARPS) of Annex 15 applies to anyone that had a role in the definition, update, forwarding, reception, handling and publishing of information in the Aeronautical Information Publication (AIP) of the State.

3.1.23 The AOP/SG/2 was informed that it was of critical importance that formal agreements be established between the State AIS and aerodrome authorities, to ensure that quality-managed aerodrome data/information was provided in sufficient time for it to be collated, checked, prepared and published by the State AIS.

Establishment of Runway Holding Position on Taxiway

3.1.24 India presented the analysis of provision in para 3.12.9 of Annex 14 Volume I and purpose of Inner Transitional Surface for establishing the runway holding position on taxiway for runway where an Obstacle Free Zone had been established and a threshold had been displaced from the physical beginning of the runway using a case study for aerodrome reference code 4E where distance between the centerlines of runway and parallel taxiway was taken 182.5 metres.

3.1.25 The AOP/SG/2 reviewed the case study presented and analysis conducted by India and deliberated a need for the further study and encouraged that the paper be submitted to the relevant group of Aerodrome Design and Operation Panel (ADOP).

Provision of Safety Line at Associated Taxiways

3.1.26 India presented a concept to adopt safety indication marking to demarcate wingtip clearance at Runway Entry Taxiway adjoining with parallel taxiways.

3.1.27 The AOP/SG/2 noted that Annex 14 Volume I Table 3.1 stipulates distance between Taxiway Center line and Runway Centre line for various configuration of runways. The meeting also noted that the aircraft holding at Runway Holding Position (RHP) on taxiway connected with parallel taxiway, waiting for entry to runway in few situations left sufficient clearance for another aircraft taxiing on parallel taxiway to cross behind the parked aircraft. However, there was no wingtip clearance indication to pilot of taxiing aircraft to assess the clearance distance.

3.1.28 The guidance to maintain a safe distance between aircraft holding on runway holding position and aircraft taxiing on parallel taxiway is provided in Paragraph 1.2.19 of Doc 9157 Part 2 - Taxiways, Aprons and Holding Bays. As per this guidance, the distance between runway centerline and centerline of the parallel taxiway often requires greater distance than distances provided in Table 3.1 of Annex 14 Volume I.

3.1.29 The AOP/SG/2 noted the issue and solution proposed, and expressed that more deliberations required for developing an appropriate solution.

Runway End Safety Areas

3.1.30 IFALPA presented pilots' perspective on Runway End Safety Areas (RESA) and highlighted how an optimized runway environment could improve accident and incident survivability.

3.1.31 Data collected by IFALPA from past incidents and accidents had shown that, in the majority of cases, an aircraft overrunning a runway and leaving the paved surface at a speed of up to 70 knots would come to a halt within 300 metres of the runway end. Therefore, the installation of RESA that meets above dimensions had significantly mitigated the risk of injury or death to passengers, crew and rescue teams. IFALPA recognized that at some aerodromes it may be impossible for an adequate (full length) RESA to be installed due to surrounding terrain and topography. In this instance, IFALPA advocated the installation of an arresting system, such as an Engineered Material Arresting System (EMAS).

3.1.32 The AOP/SG/2 noted that IFALPA emphasized the importance to make a flight crew aware of EMAS existence at a runway end making it effective through marking and depiction on appropriate aeronautical chart, as well as in their departure or arrival briefings, which would constitute a means of safe practice in the event of a runway excursion.

Proposal of Criteria on Declared Distance for Aircraft Intersection Departure Procedure

3.1.33 The paper presented by the Republic of Korea highlighted a need of a standard method/procedure for calculation of Take-Off Run Available (TORA) Distance for intersection departures, as international airports adopt the intersection departure as a standard operating procedure to reduce aircraft's ground taxing time. The meeting was provided with the procedures used by Australia, Canada, Netherlands and Philippines for determination of TORA for intersection departures. The AOP/SG/2 noted that Doc 9157 Aerodrome Design Manual, Part 1 - Runways (Paragraph 3.4 refers) that contains the method for calculation of declared distances did not contain any specification for the calculation of TORA for intersection departures.

3.1.34 The AOP/SG/2 reviewed the issue highlighted in the working paper on intersection departure procedures declared distance and appreciated. The meeting noted the issue and considered a need of systematic work in this regard.

Proposal of Vehicle Signal System in the Hot Spot of Airport

3.1.35 The Republic of Korea (ROK) presented a proposed method to guarantee the safety of aircraft on ground movement and the punctuality of aircraft operations through the installation of automatic vehicle signal system interfaced with airport surface detection radar and A-SMGCS (advanced-surface movement guidance and control system).

3.1.36 The AOP/SG/2 noted that the Incheon Airport had developed the vehicle signal system installed on service roads crossing taxiways, automatically controlled using airport surface detection radar and advances surface movement guidance and control system (A-SMGCS). The system enhanced aircraft safety regarding the intersection between taxiways and service roads to assist in the prevention of collisions between aircraft and vehicles/objects, and aircraft taxiing on-time performances as well.

3.1.37 The AOP/SG/2 reviewed and noted the proposal of ROK to consider installing vehicle signal system on the service roads crossing taxiway to prevent aircraft accident or incident and encouraged ROK to conduct a further study working together with other Member States and International Organization with the objective to achieve more benefits from the installation of the system at international airports.

ACI APEX in Safety

3.1.38 ACI presented the ACI Airport Excellence (APEX) in Safety Program describing its history, program contents, benefits to airports, costs and recent updates. The programme improves airports level of safety and compliance following ICAO Standards and Recommended Practices and adoption of ACI's best practices.

3.1.39 Recognizing the benefits of ACI's APEX in Safety program, the AOP/SG/2 encouraged airport operators to approach ACI for assistance through the APEX in Safety Program.

Status of Air Navigation Deficiencies in AOP Field

3.1.40 The AOP/SG/2 reviewed the list of Air Navigation Deficiencies noted by APANPIRG/28 in the AOP field. Cambodia, India, Maldives, Sri Lanka and Thailand provided updates on the status of their Deficiencies. The AOP/SG/2 meeting urged concerned States to provide the necessary resources for the elimination of deficiencies.

3.1.41 The AOP/SG/2 urged States to update the status of AOP Air Navigation Deficiencies prior to the APANPIRG/29 Meeting and adopted the following Conclusion:

Conclusion AOP/SG/2-3: Update of AOP Air Navigation Deficiencies

3.1.42 **Appendix D** had been updated incorporating updates received from Fiji and Myanmar on their status of AOP Air Navigation Deficiencies after AOP/SG/2 and before APANPIRG/29 meetings.

APANPIRG AOP Sub Group Task List

3.1.43 The AOP/SG/2 updated their task list, related actions, responsibility and target dates.

3.1.44 APANPIRG/29 noted that the AOP/SG/2 adopted following Decisions:

Decision AOP/SG/2-4: Asia/Pacific Wildlife Hazard Management Working Group (AP-WHM WG)

Decision AOP/SG/2-5: Asia/Pacific Aerodrome Assistance Working Group (AP-AA WG)

Decision AOP/SG/2-6: Asia/Pacific Aerodrome Design and Operations Task Force (AP -ADO/TF)

3.1.45 APANPIRG/29 further noted that the AOP/SG/2 had urged States/Administrations to nominate experts/advisors for the WHM WG, AP - AA WG and AP - ADO/TF.

Airports Climate Change Adaptation

3.1.46 ACI had presented at AOP/SG/2 its initiatives to urge airports to take action on adaptation to climate change.

3.1.47 The AOP/SG/2 noted that the ICAO Council tasked its advisory body on all matters pertaining to international aviation environmental protection, i.e., the Committee on Aviation Environmental Protection (CAEP), to intensify its activities on the topic of climate adaptation, beyond the collection of scientific information. This resulted in an update of the Airport Planning Manual, Part 2 (ICAO Doc 9184), due to be published by ICAO in August 2018, including a new Chapter 9 on climate adaptation. The CAEP/10 meeting in 2016 resolved to develop and submit for approval by the CAEP/11 meeting (February 2019) a Climate Adaptation Synthesis which highlighted that the identification of the potential impacts of climate change on airports operations and related infrastructure requires close cooperation with relevant meteorological offices and the ability to model changes in climate over time.

3.1.48 ACI highlighted a number of potential effects of climate change, including increased frequency or severity of storms, that have potential impacts to airport operations and planning which would require a risk assessment including a comprehensive list of risks, threats and vulnerabilities to all aspects of the airport business and operation.

3.1.49 The AOP/SG/2 noted that ACI had completed a briefing note on climate change adaptation for their members and a Policy Paper on climate resilience and adaptation. The Policy Paper was presented at the 56th ACI World Governing Board meeting to raise awareness of member airports on the need to proactively assess the vulnerability and risk to climate change impact and to take necessary measures to prevent negative climate change impact.

3.1.50 Recognizing the importance of climate change adaptation by airport operators, the APANPIRG/29 endorsed the following Conclusion formulated by the AOP/SG/2.

Conclusion APANPIRG/29/6: Airports Climate Change Adaptation Measures			
What: That Asia/Pacific States urge airport operators to identify the potential impacts of climate change on airports operations and related infrastructure and consider appropriate adaptation measures to address the potential climate change impacts.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☒ Environmental ☒ Ops/Technical	
Why: Enhance levels of aerodrome resilience to climate change impact		Follow-up: ☒ Required from States	
When: 5-Sep-18		Status: Adopted by PIRG	
Who: ☐ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:			

Date and Venue of Next Meeting

3.1.51 The AOP/SG/2 reviewed and agreed on the draft agenda for the Third Meeting of AOP/SG for 2019 placed in **Appendix B to the Report on Agenda Item 3.1**. The next meeting of AOP/SG would be held in last week of June 2019 in Bangkok, Thailand for 3 days

FAA Assistance to Airports in the Micronesia Region (IP/05)

3.1.52 The United States shared its long-standing relationship with the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau and an overview of Federal Aviation Administration (FAA) assistance to airports in the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau. This included assistance to improve aerodrome certification, inspection and surveillance programs and FAA Airport Improvement Program (AIP) grant funding. Six commercial service airports within the three countries had received funding. This funding has been used for safety-related improvements to meet minimum standards.

Infrared Specifications for Aviation Obstruction Light Compatibility with Night Vision Goggles (IP/06)

3.1.53 The United States shared that the use of Night Vision Goggles (NVGs) was increasing in civilian aviation to conduct search-and-rescue, emergency medical transport, and other flight operations. The use of NVGs can function to increase pilot situational awareness. However, the Federal Aviation Administration (FAA) has found that with the gradual replacement of incandescent obstruction light fixtures with LED light fixtures, some pilots using NVGs are unable to acquire red-coloured LED obstruction lights due to the light generated being outside of the combined visible and near-infrared spectrum of NVGs with objective lens filters. The FAA conducted research on the interaction of Light Emitting Diodes (LEDs) used in obstruction lighting fixtures with NVGs and had determined performance specifications for infrared (IR) emitters to be added to or used in conjunction with LED L-810, L-864 and L-885 obstruction light fixtures to ensure compatibility with NVGs with a Class B filter. The United States invited to consider adoption or implementation of the technologies and/or processes discussed to address on-going safety challenges.

Provisions on Permission for Using Civil Transport Airports in China (IP/13)

3.1.54 China shared information on application and issuance process of the permit for using a civil transport airport in China. Through a series of procedures of access, examination, issuance and alteration, and continuous inspection carried out to form a closed loop to ensure the safe operation and normal use of airports.

3.1.55 The permit for using civil transport airports, a license document, issued by the civil aviation administration of China or the regional administration of Civil Aviation. An application for the permit for using a civil transport airport shall be filed by the airport management authority in accordance with the conditions and procedures set forth in IP/13. The license is valid for five years and printed by the Civil Aviation Administration of China (CAAC). The license number is also arranged by the general administration of civil aviation.

3.1.56 After airports acquired the permit for using a civil transport airport, CAAC and related accredited institutions would be running a sustainable management of civil transport airport, according to laws and regulations, standards to the airport to carry out supervision and inspection of the airport operation for a long time, to ensure that the airport facilities required to fulfil the requirements of relevant technical standards, not affecting the safe operation of the airport and normal use.

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

3.2: ATM

ATM/SG/5 Outcomes (WP10)

3.2.1 The Sixth Meeting of the Air Traffic Management Sub-Group (ATM/SG/6) of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) was held at Hong Kong, China from 30 July to 03 August 2018.

3.2.2 The meeting was attended by 107 participants from 27 States, two Special Administrative Regions of China and six International Organizations, including Afghanistan, Australia, Bangladesh, Cambodia, China, Hong Kong China, Macao China, Fiji, India, Indonesia, Japan, Kiribati, Lao People's Democratic Republic (PDR), Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea (ROK), Singapore, Sri Lanka, Thailand, Tonga, United Arab Emirates (UAE), United States of America (USA), Viet Nam, IATA, ICCAIA, IFALPA, IFATCA, SITA, and ICAO.

RASG and APRAST Meeting Outcomes

3.2.3 APRAST/11 (Bangkok, Thailand, 20 – 24 November 2017) had suggested the need for development of a performance-based manual for safety oversight of ANSPs. The ATM/SG/6 meeting noted that the intention was to consult APANPIRG, as APRAST may not have the necessary expertise to develop such a manual.

Seamless ATM Reporting and Monitoring Update

3.2.4 The status of Seamless ATM reporting, reflecting the implementation progress of air navigation improvements set out in the *Asia/Pacific Seamless ATM Plan V2.0*, was discussed. The 16 administrations that had not submitted any reports (*or Points of Contact) were:

Afghanistan*, Brunei Darussalam, Cook Islands*, Kiribati, Marshall Islands*, Micronesia* (Federated State of), Myanmar, Nauru*, Palau*, Papua New Guinea, Samoa*, Solomon Islands, Timor-Leste, Tonga, Tuvalu* and Vanuatu*.

3.2.5 States had been urged by APANPIRG/27 to give higher priority at Civil Aviation Authority (CAA) and Air Navigation Service Provider (ANSP) levels, and to mobilize human and financial resources to complete implementation of Phase I objectives. Notwithstanding this, Phase I was far from being implemented, even three years after the initial target. Moreover, the meeting noted that in 2019, States were expected to start implementing Phase II elements, which were aligned with the Global Air Navigation Plan (GANP) Aviation System Block Upgrade (ASBU) Block 1. **Figure 3.2-1** indicates Seamless ATM implementation (July 2018).

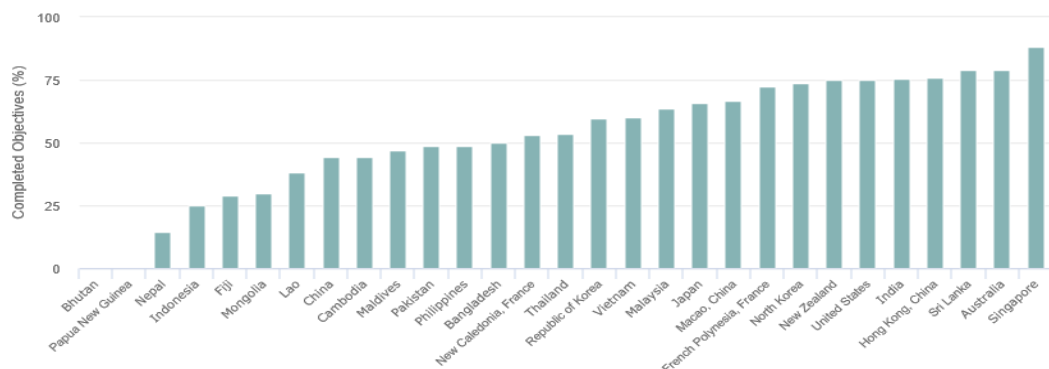


Figure 3.2-1: Percentage of Completed Applicable Phase I Seamless ATM Elements

Performance Measurement

3.2.6 EUROCONTROL, Japan, Singapore and the USA had briefed the Subgroup on progress by the Performance Benchmarking Work Group (PBWG), which described the benefits of performance measurement and benchmarking. Noting the Regional ATM Performance Measurement Framework Small Working Group (RAPMF/SWG) led by China had been created to develop a common regional framework, the ATM/SG/6 suggested the RAPMF/SWG collaborate with the PBWG to develop the final draft of the *Asia/Pacific Air Traffic Management Performance Indicator Framework and Implementation Plan* to improve the ATM performance in the region by 2019.

ASEAN ATM Master Plan

3.2.7 An overview of the Association of Southeast Asian Nations (ASEAN) *ATM Master Plan* had been provided by Singapore, on behalf of the ASEAN Secretariat. The Plan was a collaborative effort by ASEAN in support of the *Asia/Pacific Seamless ATM Plan*, providing the technical roadmap to support ASEAN Member States' efforts to achieve a Seamless ASEAN Sky.

Pearl River Delta Region ATM and Airspace Reform

3.2.8 The ATM/SG/6 meeting had congratulated China for its airspace reform, integration of ATM system data (including civil and military flight plans, flight information, surveillance data, etc.), as strategies to improve capacity in the Pearl River Delta (PRD) region, noting that the *Asia/Pacific Seamless ATM Plan* had urged China to implement 'metroplex' planning of this nature. In particular, ICAO expressed appreciation to China for its emphasis on plans to enhance civil/military cooperation. IATA also congratulated China for this initiative, but stressed that more engagement with the international airline community would be appreciated, as the airlines were ready to assist China.

Application of ATC Separation Standards

3.2.9 ICAO presented information on a Seamless ATM survey conducted to determine which ATC separation standards were being applied within the Asia/Pacific Region. **Figure 3.2-2** indicated the efficiency of ATC separations that were theoretically applied, as at July 2018.

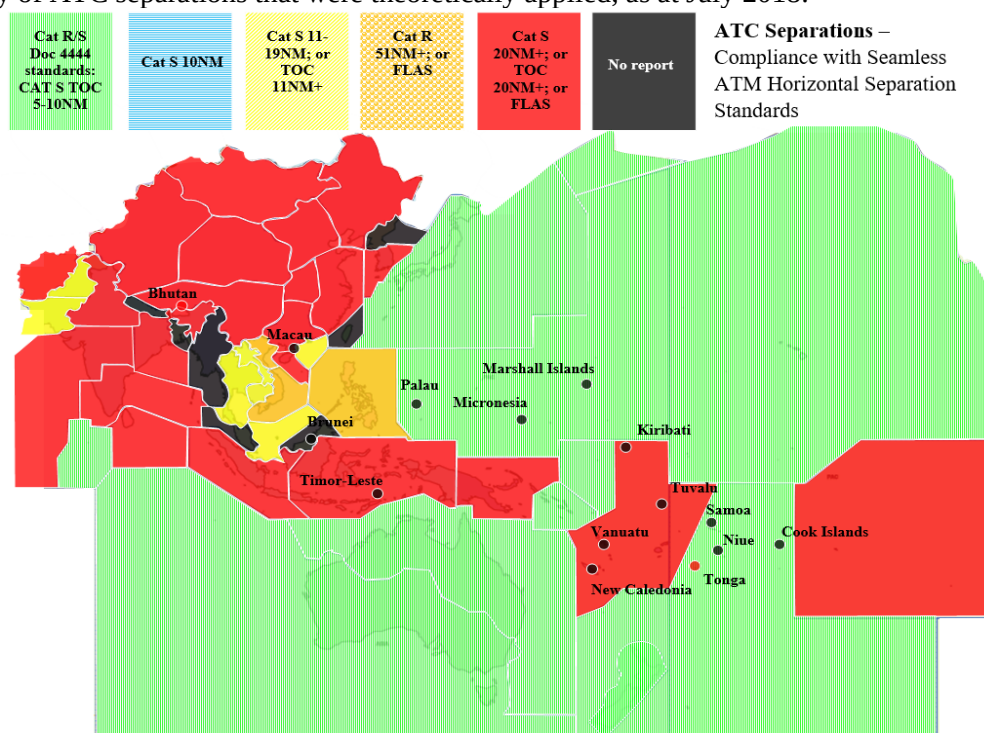


Figure 3.2-2: Seamless ATM Horizontal Separation Standards Compliance (as at July 2018)

3.2.10 ICAO commented that in general, several States were not applying ATC standards correctly, preferring to use larger, less efficient separations, which also affected safety due to the increased ATC workload managing larger spacing, and more conflicts. In this case, ATC had not optimised service levels that new systems were capable of under the *Asia/Pacific Seamless ATM Plan*.

3.2.11 The Combined Eighth Meeting of the South Asia – Indian Ocean ATM Coordination Group and Twenty-Fifth Meeting South East Asia ATS Coordination Group (SAIOACG/8 and SEACG/25, Siem Reap, Cambodia, 26 – 30 March 2018) noted that only 45% of administrations had responded to the survey related to ATC separations. The following Conclusion that had originated from the SAIOACG/8/SEACG/25 was agreed by the ATM/SG/6:

Conclusion ATM/SG/6-1: ATC Separations Standards Survey

3.2.12 New Zealand and China had provided information on planning for the implementation of more efficient separation standards.

3.2.13 Within the Auckland Oceanic Flight Information Region (FIR), software was being developed to enable the application of Automatic Dependent Surveillance – Contract Climb Descent Procedure (ADS-C CDP) to facilitate longitudinal separation of 15 NM under certain conditions. New 20 NM and 12 NM lateral separations, a 20 NM longitudinal standard (under development by the Separation and Standards Panel) and future use of Automatic Dependent Surveillance-Contract (ADS-B) In-Trail Procedure for 15 NM longitudinal separation were being planned or considered.

3.2.14 China announced that most ATC units in China strictly complied with separation minima in Doc4444 and ATC separation in the remaining ATC units between aircraft under ATC surveillance would be further improved to 10 km (5 NM) en-route and 6 km (3 NM) in terminal airspace. Moreover, the transfer spacing between Chinese Area Control Centres (ACCs) would reduce from 30 km (15NM) to 20 km (10NM) by 30 September 2018.

3.2.15 ICAO congratulated China for this step, and urged other States in the Asia/Pacific Region to follow China's example. ICAO also noted China's expectation to strengthen bilateral coordination in order to increase capacity by reducing transfer spacing. Hong Kong, China advised that they would work closely with China on enhancing efficiency of spacing, and would like to share the safety assessment China conducted in this regard to facilitate its work.

Air Traffic Flow Management Steering Group Outcomes

3.2.16 The meeting was informed of the outcomes of the Eighth Meeting of the Air Traffic Flow Management (ATFM) Steering Group (ATFM/SG/8, New Delhi, India, 14 – 18 May 2018).

3.2.17 The ATFM/SG/8 meeting had been informed by Indonesia that flow control restrictions on ATS routes in the SCS area had been delaying flights from Jakarta FIR by up to five hours.

3.2.18 The meeting was also updated on India's implementation of the Central ATFM system, the integration of the Central ATFM with Airport CDM/Airport Operations Command Centre (A-CDM/AOCC), C-ATFM post-operations analysis, and the establishment of Airspace Management Cells. The timing of implementation of Phase III of cross-border ATFM had not yet been determined. India was monitoring the progress of other cross-border ATFM implementation activities in the Region.

3.2.19 China, Japan and the ROK together presented to ATFM/SG/8 the outcomes of the Sixth meeting of the Northeast Asia Regional ATFM Harmonization Group (NARAHG/6, Seoul, ROK, 12 – 14 March 2018), and on the progress of the Cross Region ATFM Collaborative Platform (CRACP), tentatively planned for completion in 2020.

3.2.20 ATFM/SG/8 observed that ICAO Doc 9971 *Manual on Collaborative ATFM* stated that implementation of Calculated Time Over (CTO), which used the aircraft Required Time of Arrival (RTA) function, was a gradual process that required education and collaboration to ensure that requirements were understood and met, and that such techniques were advanced, requiring substantial experience for implementation.

3.2.21 An update on the Distributed Multi-Nodal ATFM Project focused on recent achievements in implementation of ATFM measures (GDPs), and the work plan for the development of ATFM measures for airspace congestion. The Multi-Nodal ATFM Project Core Team and its Technical Sub-Group had agreed to use the EUROCONTROL Slot Allocation Message (SAM) for the exchange of ATFM data until the establishment of a System-Wide Information-Management (SWIM)-based ATFM information exchange using the Flight Information Exchange Model (FIXM).

3.2.22 ATFM/SG/8 had reviewed the results of an analysis of missing Flight Plan (FPL) and Departure (DEP) messages requiring corrective action to be taken by States and/or airspace users. The data-gathering and analysis activities were conducted in response to **Conclusion APANPIRG/27/12: Origination and Distribution of Departure (DEP) Messages**, and the discussion outcomes of ATM/SG/5 which requested the scope of the analysis of missing DEP messages be broadened to include missing FPL messages.

3.2.23 The five APAC States participating in the data gathering activity reported non-receipt of 58 FPL and 582 Departure during the 24-hour analysis period. Of these, 50 FPL and 337 DEP messages were for flights departing from APAC aerodromes. Actions undertaken by the ICAO Asia/Pacific Regional Office since ATFM/SG/8 had included the issuance of a State Letter on the subject to all Asia/Pacific States, and to relevant non-APAC States through their respective ICAO Regional Offices, individual letters to APAC States where the analysis indicted systemic failure to originate DEP messages, and coordination with ICAO Headquarters (HQ). APANPIRG ANS Deficiencies had also been proposed.

3.2.24 In accordance with **Conclusion ATM/SG/5-3: Asia/Pacific Regional Framework for Collaborative ATFM Amendment**, the ATFM Implementation Status Report form had been appended to the Framework document and made available on the ICAO APAC Regional Office website. Only one report had been received before the due date (end of April each year). States were reminded that the reporting form provided evidence of implementation of ATFM, which States had for some time been obliged to implement in accordance with the standards of Annex 11, and non-reporting would be treated in the same way as non-implementation.

3.2.25 Regarding the development of an APAC ATFM post-operations analysis framework, it was noted that no regionally-recommended compliance measurement had been established. The ATM/SG/6 agreed to the following Conclusion that had been developed by the ATFM/SG/8:

Conclusion ATM/SG/6-2: Recommended CTOT Compliance Window

Information Management for Activation of FUA Structures

3.2.26 India had proposed a format for Airspace Use Plans (AUP) or Updated Airspace Use Plans (UUP) utilised the pre-tactical phase (within 24 hours of operation), for activation of FUA structures and also proposed measures intended to mitigate the reduced advance notification time risks.

3.2.27 India had observed that Annex 15 *Aeronautical Information Services* paragraph 5.1.1.4 stipulated that at least seven days' advance notice was required for the activation of established danger, restricted or prohibited areas and of activities requiring temporary airspace restrictions (including the non-ICAO Temporary Reserved Areas (TRAs) and Temporary Segregated Areas (TSAs), other than for emergency operations.

3.2.28 ICAO had noted that this standard had been discussed at HQ and would not be amended in the short-term. ICAO also stated that as had been previously informed, if a State was imposing a temporary airspace restriction in non-compliance with Annex 15's notice requirements by using a TRA or TSA without a network manager or equivalent function as part of a centralised ATFM system to mitigate the risks or disruption, then this would be submitted for consideration as an APANPIRG Deficiency.

BOBCAT ATFM Operations

3.2.29 Thailand presented an operational analysis and overview of westbound flights through the Kabul FIR associated with the Bay of Bengal Cooperative Air Traffic Flow Management (BOBCAT) system. India presented issues related to ATFM operations through the BOBCAT system within the Delhi FIR, including details of issues affecting, or affected by, BOBCAT slot and entry level allocations, and proposed mitigation strategies, and suggestions for improvement. Delhi ACC was experiencing problems during peak periods for westbound traffic that would transit via Afghanistan.

3.2.30 While noting the issues reported by India, the meeting also recognised the need for a discussion on whether the ongoing capacity constraint in the Kabul FIR was necessary, given the improvement in surveillance coverage, and on future provision of ATFM by India's C-ATFM system.

3.2.31 Afghanistan informed the meeting that a current surveillance project, together with existing radar coverage, would lead to an improvement in longitudinal separation from 50 NM to 30 NM in coming months, with further improvements expected after further proving activities. IATA agreed with the need to prioritise the enhancement of Afghanistan with a transition plan from BOBCAT, but recalled that agreed separations such as 50 NM longitudinal had not been properly implemented.

3.2.32 The Chairman stated that Pakistan and India should work together to establish more tactical capability. Given the development of Afghanistan's ATS surveillance capability, the meeting agreed to the States concerned and ICAO developing a transition plan as a matter of priority.

Mode S Conspicuity Code – Amendment to eANP Vol II

3.2.33 Australia and the Co-Chairs of the Surveillance Implementation Coordination Group (SURICG) provided information identifying future requirements for a regional Mode Select (Mode S) Secondary Surveillance Radar (SSR) conspicuity code. The information provided noted the typical allocation processes for discrete Mode A SSR codes, and the assignment of blocks of codes to Asia/Pacific Administrations in the APAC Air Navigation Plan (ANP).

3.2.34 As traffic volumes increased, the finite number of discrete Mode A SSR codes would increase the likelihood of the same code assigned to multiple aircraft, increasing the risk of mis-identification. An alternative was the use of the Mode S Aircraft Identification and/or ICAO Aircraft Address for identification and flight plan coupling, provided States used Mode S radar systems and suitable ATM system capability.

3.2.35 Noting the *Asia/Pacific Seamless ATM Plan*, the *Surveillance Strategy for the Asia/Pacific Region*, the *European SSR Code Management Plan 2010*, and India's trial non-discrete Mode A SSR conspicuity code implementation, the ATM/SG/6 meeting agreed to the following Conclusion:

Conclusion ATM/SG/6-3: Proposed Air Navigation Plan Volume II Amendment

SID/STAR Phraseology Implementation

3.2.36 Australia presented progress of the implementation of ICAO Standard Instrument Departure/Standard Arrival Route (SID/STAR) phraseology, informing about the issues realized following implementation on 09 November 2017. Information was provided on the safety assessment and safety work, ATC workload increases, the use of level restrictions in published SID/STAR for strategic separation, and discussion of what constitutes an aircraft being ‘on SID/STAR’.

3.2.37 Australia requested feedback from other States on the issue of the use and implications of the term ‘VIA’ (which meant the procedure’s restrictions remained in force) and additional examples to clarify the intent of various operational scenarios. IFALPA also stressed the need for examples that contained intermediate level or speed restrictions, to reduce interpretation issues.

3.2.38 Australia, IFATCA and IATA had noted the continuing operational issues in applying the new SID/STAR standard, and supported a harmonised transition strategy. IFATCA had suggested that there may be a need for a re-think of the standardised approach for SIDs and STARs as the current generation of procedures did not have a constant climb/descent component.

3.2.39 IATA was concerned that a number of global changes recently such as PBCS, SID/STAR and Global Aeronautical Distress and Safety System (GADSS) that had not been managed well in terms of implementation, so ICAO HQ needed to reconsider the way in which these global changes were being developed to take into account the impact on actual operations, and effective implementation.

3.2.40 The meeting had noted the establishment of the *ICAO SID STAR Implementation Support Team* (ISSIST), and a range of suggestions received by ISSIST from industry to improve implementation. Information was also provided on the ISSIST Work Program, which was expected to be completed by March 2019.

3.2.41 IFALPA stated that the variations in implementation between States was the most concerning matter, and urged States to implement at a regionally-agreed date. Furthermore, the meeting had noted that if States had not implemented the changes, a Difference would need to be filed under Article 38 of the Convention. The meeting was informed that only Australia, New Zealand and Singapore had reported that they had implemented the new SID/STAR phraseology. The ATM/SG/6 meeting agreed to the following Conclusion:

***Conclusion ATM/SG/6-4: Asia/Pacific Regional SID/STAR Phraseology
Implementation Strategy***

Recent CNS-Related Developments in APAC

3.2.42 ICAO updated the meeting on recent developments in the Communications, Navigation and Surveillance (CNS) fields. The ATM/SG/6 meeting reviewed the discussion outcomes, Conclusions and Draft Conclusions arising from the Twenty-Second Meeting of the CNS Subgroup (CNS/SG/22, Bangkok, 16 – 20 July 2018).

3.2.43 Regarding *Draft Conclusion CNS SG/22/12 – Ground-Based GNSS Status Monitoring*, the USA commented that while they understood the importance of States determining the essential radio navigation services for GNSS based operations, the need for a Conclusion as a whole was not understood. After discussion and input from Australia, the meeting agreed that there was insufficient basis to support the Draft Conclusion, and it was referred back to the CNS/SG for further consideration.

3.2.44 Regarding *Draft Conclusion CNS SG/22/17 – Amendment of Asia/Pacific Seamless ATM Plan*, ICAO stated that proposals for amendment to the *Asia/Pacific Seamless ATM Plan* did not require an APANPIRG Conclusion; however, the specific matter was important to highlight to State planners, so the Conclusion was considered to have merit on that basis, and was subsequently endorsed.

3.2.45 Australia stated that the matter of transitioning PBN charts from Area Navigation (RNAV) to Required Navigation Performance (RNP) titles would cause significant workload and it would take time to implement, given the large volume of instrument flight procedures affected. Australia therefore supported a regional transition strategy.

3.2.46 APANPIRG/29 agreed to the following Conclusion, which had been developed by the CNS/SG as *draft Conclusion 22/13*, and had then been endorsed as an ATM/SG Draft Conclusions:

Conclusion APANPIRG/29/7: Transition Planning for RNP APCH CHART Identification from RNAV to RNP		
What: Recognizing ICAO Circular 353, Transition Planning for Change to Instrument Flight Procedure Approach Chart Identification from RNAV to RNP will be finalized to provide guidance on the development of global, regional and State transition plans, and ICAO Regional Office is requested to develop a draft transition plan within twelve months of the final publication of the Circular, that: a) States begin internal coordination on the State transition plan and provide the number of RNP APCH procedures published and planned, and the time required to transition from RNAV (GNSS)/RNAV (RNP) to RNP chart identification; b) ICAO Regional Office drafts a regional transition plan on RNP APCH chart identification in coordination with relevant regional contributory bodies of APANPIRG, sub-regional ATM coordination groups and regional stakeholders; and c) ICAO Regional Office conducts a meeting or workshop to discuss the regional transition plan, after a regional transition plan template has been provided by the ICAO PBN Programme Office.	Expected impact: ☒ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: To commence preparation for the global regional and State planning for transition of approach chart identification from RNAV to RNP.	Follow-up: ☒ Required from States	
When: 5-Sep-18	Status: Adopted by PIRG	
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☒ Other: RSO		

3.2.47 APANPIRG/29 agreed to the following Conclusion, which had been developed by the CNS/SG as *draft Conclusion 22/16*, and had then been endorsed as an ATM/SG Draft Conclusion:

Conclusion APANPIRG/29/8: Proposal for amendment to PANS-ATM (Doc4444) on ADS-B related Phraseology			
What: Recognizing that: 1. where system functionality is derived from the same source for both MODE S SSR and ADS-B the phraseology used between ATC and pilots should be the same; 2. in almost all cases, the pilot interfaces with the ADS-B system through the SSR transponder interface; and 3. the use of ADS-B-specific phrases may cause confusion between pilots and ATC; ICAO be invited to amend PANS-ATM to remove the following phrases: 12.4.3.5 “RE-ENTER ADS-B AIRCRAFT IDENTIFICATION” 12.4.3.7 “TRANSMIT ADS-B IDENT” 12.4.3.10 “STOP SQUAWK TRANSMIT ADS-B ONLY” or “STOP ADS-B TRANSMISSION, SQUAWK (CODE) ONLY” 12.4.3.11 “TRANSMIT ADS-B ALTITUDE” 12.4.3.13 “STOP ADS-B ALTITUDE TRANSMISSION [(WRONG INDICATION, or reason)]”		Expected impact: ☒ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: To remove phrases from PANS-ATM that cause confusion to pilots and ATC, recognizing that the greater majority of ADS-B installations in aircraft use the same pilot interfaces as the Mode S SSR transponder.		Follow-up: ☐ Required from States	
When: 5-Sep-18		Status: Adopted by PIRG	
Who: ☐ Sub groups ☐ APAC States ☒ ICAO APAC RO ☒ ICAO HQ ☐ Other:			

eANP FIR SRR Update

3.2.48 An update was provided on the electronic Air Navigation Plan (eANP) FIR and Search and Rescue Region (SRR) data analysis that had been on-going since 2014.

3.2.49 *APANPIRG Conclusion 28/5 FIR/SRR Air Navigation Plan Review* had urged Asia/Pacific States and Administrations having responsibility for the provision of services within a FIR or Aeronautical SRR to conduct a review of the ICAO data related to the FIR or SRR, and provide a verification to the Regional Office as early as possible, but not later than 31 December 2017. Although three State Letters had been issued on this matter, there had still been a poor engagement from States on a matter of this importance.

3.2.50 Therefore, ICAO’s intention was to signal to APANPIRG/29 that the FIR/SRR data review from States was expected to be completed by 01 July 2019. ICAO then planned to propose to APANPIRG/30 that the data in **ATM/SG/6/WP24 Attachment B and C** (as amended by 01 July 2019) be published in the eANP after circulation by PfA. The meeting had noted that once published, States would need to file a PfA for any subsequent change.

Civil/Military Cooperation

3.2.51 IATA presented an update on ballistic launch/re-entry event issues and proposed regional procedures to improve the management of such events, particularly involving multiple FIRs. IATA noted that although the *Asia/Pacific Seamless ATM Plan* (paragraphs 5.68 and 7.60) contained specific expectations for ballistic launch/re-entry events, they were still experiencing less than optimal management of ballistic events when affecting large airspace areas, and provided specific examples.

3.2.52 China had stated that the issue of the 09 May 2018 event was not a matter that the CAAC could manage, so it needed to seek the opinions of the relevant rocket launching agency and formally reply to ICAO. At the same time, the Chinese representative informed that it may not be feasible to utilise the procedures proposed by IATA due to technical reasons such as weather and other technical conditions, according to the conditions. ICAO stated that the relevant procedures were only guidance for States.

3.2.53 China also noted that the rocket launch issue was a global problem. China proposed that ICAO report the matter to ICAO HQ and formulate globally unified standards and procedures.

3.2.54 The ATM/SG/6 meeting agreed to the establishment of a ‘State Planning Checklist’ to supplement the *Asia/Pacific Seamless ATM Plan*’s expectation.

3.2.55 Noting that the Checklist and guidance would be further refined by ICAO in coordination with IATA, the following Draft Conclusion was agreed by APANPIRG/29:

Conclusion APANPIRG/29/9: Procedures for Ballistic Launch/Space Re-entry Management			
What: That, States are urged to: (1) ensure adoption and sensitisation of the ballistic launch/space re-entry expectations contained with the <i>Asia/Pacific Seamless ATM Plan</i> ; and (2) institutionalise the related guidance and State Planning Checklist provided at Appendix A to the Report on Agenda Item 3.2 .		Expected impact: ☒ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: To improve State planning and preparation for ballistic launch and space re-entry activities, in order to reduce adverse effects on airspace users and Air Navigation Service Providers.		Follow-up: ☒ Required from States	
When:	5-Sep-18	Status:	Adopted by PIRG
Who: ☐ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:			

3.2.56 ICAO recalled that civil/military cooperation remained one of the highest regional priorities in the *Asia/Pacific Seamless ATM Plan*. ATM/SG/6/WP26 provided examples of military operations or activity affected or controlled by military agencies which were of concern. The examples included issues related to an Air Defence Identification Zones (ADIZ), Air Defence Codes (ADCs), operation of Special Use Airspace (SUA), ballistic launch and space re-entry activity, and significant delays and disruptions to civil air traffic in East Asia.

3.2.57 The ATM/SG/6 meeting had noted that while there had been continuing instances of poor civil/military cooperation, there had also been an improvement evident in some systems. In particular, the meeting observed that China had taken a number of steps to enhance capacity and safety, and ICAO noted that a continued effort in this regard should lead to a decrease in the major delays that had been reported in the area.

3.2.58 The APANPIRG/29 noted with interest information provided by ICAO in **ATM/SG/6/Flimsy 06** on relevant high seas requirements provided in **Appendix B** to the Report on Agenda Item 3.2. States discussed key points such as the right of unobstructed transit by State aircraft in the high seas, the lack of recognition in international law of ADIZ, and the lack of a need for ADCs if civil FPL data was available.

3.2.59 The meeting noted that, given that supporting the vital air navigation infrastructure of any State was consistent with the military mission to defend the nation’s economy, States were invited to study the examples as a matter of positive development for civil and military systems.

3.2.60 Regarding ADCs, India had stated that further consultation with other stakeholders within India was required, and the status would be reviewed. India also discussed concerns related to the frequent sighting of unknown aircraft – presumed to be military – within controlled airspace over the high seas.

3.2.61 In this regard, the ATM/SG/6 had endorsed the following Draft Conclusion, which was agreed by APANPIRG/29:

Conclusion APANPIRG/29/10: Minimizing the Impact of Non-ICAO Procedures and Requirements for Military Activities Affecting Civil Aviation		
What: That, where the imposition of non-ICAO military requirements and procedures affecting international civil aviation is either planned or likely, States are urged to ensure that civil aviation interests are taken into account by: 1) ensuring military authorities are fully informed of the obligations of all States that are signatory to the Convention on International Civil Aviation; 2) conducting full and timely consultation with airspace users, adjacent States and ICAO; 3) implementing the capability to tactically share FPL and ATS messages, civil ATC surveillance data and other relevant information between the ANSP and military authorities; 4) implementing direct communications facilities between military organizations and the ANSP to permit the coordination of requests for information on any unknown aircraft; 5) establishing civil-military coordination functions within civil air traffic control centres; 6) promulgating timely, clear and unambiguous information on the requirements and procedures, and accurate, detailed charts in accordance with the requirements of ICAO Annex 4 and Annex 15; and 7) where pre-authorizations for individual civil flights in affected areas are necessary, States are urged to either consider: i) issuing authorizations with the seasonal schedule approval; or ii) developing and rigorously test clear and, ideally, automated procedures for compliance such as the use of flight plan data.	Expected impact: ☒ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: To avoid confusion increased workload and increased risk of military intervention for civil flights operating in airspace where non-ICAO military requirements and procedures are imposed.	Follow-up: ☒ Required from States	
When: 5-Sep-18	Status: Adopted by PIRG	
Who: ☐ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:		

Regional ATM Contingency Planning and Status Reporting

3.2.62 ICAO had presented information on the Asia/Pacific Regional Contingency Plan's status reporting strategy, based on *Conclusion ATM/SG/5-8: Asia/Pacific Regional ATM Contingency Plan Amendment*. The Regional ATM Contingency Plan Monitoring and Reporting Form had been uploaded to the ICAO Asia/Pacific Regional Office website, and Asia/Pacific Administrations were expected to report their ATM Contingency Plan implementation status at least once annually.

3.2.63 Noting that Annex 11 section 2.31 required ATS authorities to develop and promulgate contingency plans, the meeting was informed that, commencing in 2019, the ICAO Regional Office would report annually the receipt, or non-receipt, of completed Contingency Plan Monitoring and Reporting Forms, for consideration for addition to the APANPIRG ANS Deficiencies List.

3.2.64 The meeting was also reminded that the ATM contingency plans of all Administrations must include contingency responses for volcanic ash cloud, as these could, and did, affect airspace and aerodromes in States that had no volcanoes.

SAIOACG and SEACG Meeting Outcomes

3.2.65 The meeting was provided with an overview of a number of outcomes related to ATM coordination from the SAIOACG/8 and SEACG/25 (Siem Reap, Cambodia, 26 – 30 March 2018).

3.2.66 The SCSTFRG had identified three priority areas, with action plans for each. With regard to Priority Area 3 (ATS routes A461/A583/L625/N892), Philippines intended to progressively reduce longitudinal separation and specify RNP 10, then RNP 4 and RNP 2 in the fourth quarter of 2019.

3.2.67 A side meeting was held during SAIOACG/8/SEACG/25 to discuss and agree the way forward for Priority Areas 1 (A1/A202) and 2 (L642/M771). A further side meeting was held to discuss planning for the First Meeting of the Bay of Bengal Traffic Flow Review Group (BOBTFRG, established under SAIOACG). Summaries of discussions of the side meetings was provided in **ATM/SG/6 WP/29 Attachments A and B**).

3.2.68 As part of efforts to reduce the safety risk in the South Asia/Indian Ocean airspace, India had finalized and signed new coordination agreements with Indonesia, developed a draft agreement with Malaysia, and agreed with Oman to initiate various steps to reduce the occurrence of Large Height Deviations (LHDs) due to coordination error.

Trans-Regional ATS Coordination

3.2.69 ICAO presented information on trans-regional Air Traffic Services (ATS) coordination, focusing on the interfaces between the ICAO Middle East (MID) Region and the Asia/Pacific Region (APAC), and between the European Region (EUR) and APAC. The Second and Third Meetings of the AIRARD/TF (AIRARD/TF/2, Astana, Kazakhstan, 26 – 27 October 2017 and AIRARD/TF/3, Amman, Jordan, 01 – 02 May 2018) had discussed a number of key improvement areas, such as trans-regional routes and associated waypoints, the PBN Highway concept, and longitudinal separation and spacing.

3.2.70 The UAE delegate, as Vice Chair of the MIDANPIRG, had urged States to support the Advanced Inter-Regional Air Traffic Services Route Development Task Force (AIRARD/TF) not just by attending but also with active participation, as this was considered to be an important body to manage the critical interface between regions. India also urged a greater focus on the African Region as the Mumbai FIR managed an increasing traffic volume serving Africa.

3.2.71 The provisional AIRARD/TF agenda had been adopted by the MID's MIDANPIRG, but needed to be endorsed by the other regions. APANPIRG/29 agreed to the following Decision:

Decision APANPIRG/29/11: AIRARD/TF Terms of Reference			
What:	That, the Advanced Inter-Regional Air Traffic Services Route Development Task Force (AIRARD/TF) Terms of Reference at Appendix C to the Report on Agenda Item 3.2 be approved by the Asia/Pacific (APAC) Region.	Expected impact:	☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why:	To endorse the AIRARD/TF Terms of Reference, as already approved by the MIDANPIRG.	Follow-up:	☐ Required from States
When:	5-Sep-18	Status:	Adopted by PIRG
Who:	☐ Sub groups ☐ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other: MIDANPIRG, EANPG		

ATS Route Catalogue

3.2.72 ICAO presented the *Asia and Pacific Region ATS Route Catalogue* Version 16.1 for review and update as Version 17.0. States were urged to review and categorise route proposals.

3.2.73 IATA had conducted a review of the *Asia and Pacific Region ATS Route Catalogue* using a focus group of IATA airlines, except for the Russian trans-regional routes. ICAO proposed to take into account the comments from IATA then work with States on the proposals, then prepare Version 17.0 which will be shared on the ICAO website.

AKARA Corridor

3.2.74 IATA presented a proposal to address the issues associated with the management of the airspace known as the 'AKARA Corridor', with the aim of normalising service delivery in the area in accordance with Annex 11 requirements (i.e.: a single ATC unit operating within a single volume of airspace). IATA noted that aircraft operators had long held safety concerns, prompting the issuance of an 'Operational Notice' on the area, with the most recent version being issued in November 2017. Given the original arrangement had been established in 1983 between the three States and ICAO by Memorandum of Understanding (MOU), IATA had suggested that these States urgently discuss how to plan and implement a structure to increase safety levels and comply with international standards, and that International Organisations would support this effort if required.

3.2.75 The ROK had thanked IATA for the presentation, and noted the safety concerns that had been evident for several years, commenting specifically on the increasing traffic. Moreover, the ROK stated that they would like to urge the States concerned to discuss the AKARA Corridor and looked forward to a closer cooperation with the States.

3.2.76 China had recalled the need for improved efficiency within the Corridor by improving longitudinal transfer spacing from 20NM to 15NM before the Olympics.

3.2.77 China observed that there was no ATS LOA between Shanghai and Incheon. However, China advised that Shanghai would assist with any contingency procedures for emergency descent, the implementation of SLOP, and direct tracks where possible.

3.2.78 China had also advised that the ANSPs concerned should discuss and resolve the issues under the framework of the existing MOU, which was reiterated by the Chinese delegation at APANPIRG/29.

3.2.79 IATA thanked China and the ROK for their encouraging and positive responses. China stated that they fully supported the ATM operation normalisation. Japan stated that they were working with both ROK and China to improve safety, with satisfactory changes in the near future.

3.2.80 As reported by RASMAG and the ATM/SG previously, the meeting noted that the airspace of major concern was only that portion east of position SADLI, which was currently serviced by both the Fukuoka ACC (west-east flights), and the Incheon ACC (north-south flights). In conclusion, ICAO thanked the States concerned and expressed the desire for bilateral agreement on the principles of transition to a safer arrangement would lead to a wider agreement by all the stakeholders to the MOU.

3.2.81 IATA had proposed a Draft Conclusion. China requested a modification to reflect the fact that the main safety focus was on the portion of the AKARA Corridor east of SADLI as follows:

Draft Conclusion ATM/SG/6-X: AKARA-FUKUE Air Corridor ATM Operation Normalisation

That, considering the elevated safety risks and efficiency issues associated with the portion of the AKARA-FUKUE Air Corridor east of position SADLI of the Incheon Flight Information Region (FIR) known as the AKARA Corridor that had been reported by RASMAG in recent years, China, Japan and the Republic of Korea were urged to normalize ATM operational procedures within this airspace as a matter of urgency.

3.2.82 However, in discussion during the reading of the report, the ROK delegation did not agree with the Draft Conclusion. Therefore, in the absence of consensus the ATM/SG/6 could not agree to the Draft Conclusion.

3.2.83 At APANPIRG/29, the ROK noted the positive discussions on AKARA thus far and stated that they looked forward to continuing multi-lateral or bi-lateral dialogue as appropriate. The APANPIRG Chair encouraged the States to discuss the issues for a successful outcome, noting that the safety concerns needed to be resolved.

3.2.84 IATA stated that they were encouraged but requested a timeline for resolution, noting that bilateral and multi-lateral meetings had occurred in the past without resolution. IATA also observed that the traffic volumes had increased significantly since the MOU had been signed in 1983, and RASMAG had clearly detailed safety concerns, which had resulted in an IATA Operational Notice. The Chair requested that the States concerned continued to work together to normalize air traffic operations in the Corridor and report to ICAO on the progress of their discussions, so that ICAO could then report to APANPIRG/30.

Asia/Pacific Unmanned Aircraft Systems Task Force Outcomes

3.2.85 The meeting was informed of the outcomes from the Second Meeting of the Asia/Pacific Unmanned Aircraft Systems Task Force (APUAS/TF/2 Bangkok, Thailand 05 to 08 February 2018).

3.2.86 The Remotely Piloted Aircraft Systems (RPAS)/3 and DRONE ENABLE/2 symposiums that would be held in Chengdu, China from 10 to 14 September 2018. ATM/SG/6 participants were requested to ensure their State was represented at the symposiums, particularly DRONE ENABLE/2, in order to share knowledge on global developments in the management of UAS.

3.2.87 The meeting had noted that the International Organization for Standardization (ISO) had commenced work on *ISO 21384-1 Aerospace – Unmanned Aircraft Systems* and a draft development plan for UTM. ICAO did not have a clear understanding of the role of ISO with regard to the new area of ‘operational standards’.

3.2.88 The meeting noted that there was a concern that ISO standards might impose extra costs [that might reduce the likelihood of public compliance] and impose extra requirements for parts of aviation that were already regulated, such as ANSPs. ICAO HQ was following up to clarify the role of ISO in UAS.

3.2.89 APUAS/TF had commenced work on draft regulatory guidance for the operation of small UAS, initially guided by a Table of Contents for State Regulations for UAS, which was being developed by the Joint Authorities for Rulemaking on Unmanned Systems (JARUS).

3.2.90 Noting that the outcomes of HLSC 2015, the 39th Session of the Assembly of ICAO, and the RPAS/2 and DRONE ENABLE symposiums had led to the commencement of a global effort to be conducted under the UAS Advisory Group (UAS-AG) in three streams of UAS Traffic Management, the meeting agreed that the scope of work of APUAS/TF should be amended.

3.2.91 APANPIRG/29 agreed to the following Decision:

Decision APANPIRG/29/12: Revised APUAS/TF Terms of Reference			
What:	That, recognizing the scope of work on Unmanned Aircraft Systems (UAS), and particularly UAS Traffic Management (UTM) Systems being undertaken at the global level by the UAS Advisory Group, the revised APUAS/TF Terms of Reference at Appendix D to the Report on Agenda Item 3.2	Expected impact:	☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why:	To revise the scope of work of APUAS/TF, recognizing the work now being undertaken at the global level	Follow-up:	☐ Required from States
When:	5-Sep-18	Status:	Adopted by PIRG
Who:	☐ Sub groups ☐ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:		

Multiple Line-Ups on the Same Runway

3.2.92 India had presented a proposal to include Multiple Line-ups on the Same Runway procedures within the Asia/Pacific portion of ICAO Doc 7030, as these had already been adopted as European (EUR) *Regional Supplementary Procedures*. The ATM/SG/6 meeting discussed the proposal, noting that several States had allowed this procedure for decades.

3.2.93 The ATM/SG/6 meeting also noted that it was not necessary for States to have a Doc. 7030 procedure established to enable a State to approve such procedures within sovereign airspace, and that it was also unnecessary to develop a Conclusion. Notwithstanding this, to ensure visibility of the issue, the meeting agreed to the following Conclusion:

Conclusion ATM/SG/6-12: Multiple Line-Ups on the Same Runway

3.2.94 India was reminded of the need to submit a Proposal for Amendment (PfA) to Doc 7030, to the ICAO Asia/Pacific Regional Office

AIS – AIM Implementation Task Force Outcomes

3.2.95 The outcomes of the Thirteenth Meeting of the Aeronautical Information Services (AIS) – Aeronautical Information Management (AIM) Implementation Task Force (AAITF/13, Bangkok, Thailand, 04 to 08 June 2018) were provided to the meeting.

3.2.96 Three AIS-AIM-related ANS Deficiencies had been identified by the AAITF: WGS-84 not implemented (12 States), AIP Format (two States) and Quality Management System not implemented (23 States). There had been ongoing and increasing concern about poor quality management of aeronautical information in the APAC Region, and the apparent lack of organizational priority for this safety-critical requirement.

3.2.97 The meeting was informed of AIM transition progress in the APAC Region. Progress was measured against the transition steps outlined in the ICAO Roadmap for Transition from AIS to AIM, and was recorded in the AIM Transition Table available on the ICAO Asia/Pacific Regional Office website at <http://www.icao.int/APAC/Pages/edocs.aspx>.

3.2.98 States that had never provided information were Brunei Darussalam, Marshall Islands, Micronesia, Nauru and Palau. A total of 13 Administrations had provided information since AAITF12, which compared poorly with the AAITF/12 report (22 Administrations had updated progress).

3.2.99 **Figure 3.2-3** and **Figure 3.2-4** illustrated the overall Regional Implementation of Phase 1 of the Roadmap for Transition from AIS to AIM (approximately 73%, compared to 71% at AAITF/12) and Phase 2 of the Roadmap (approximately 37%, compared to 34% at AAITF/12). This indicated that there has been, in general region-wide terms, little further progress in the last year. Overall Regional implementation of Phases 1 and 2 of the Roadmap was approximately 48%, compared to approximately 44% at AAITF/12.

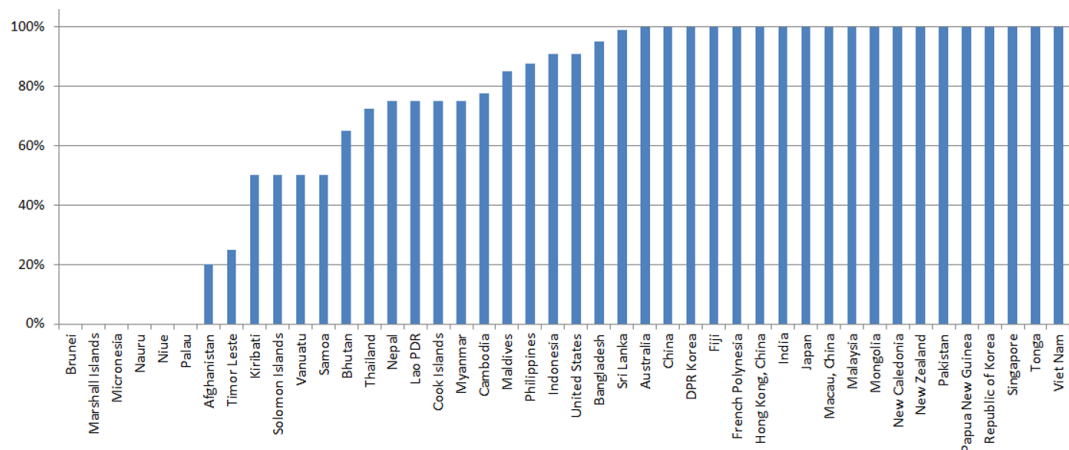
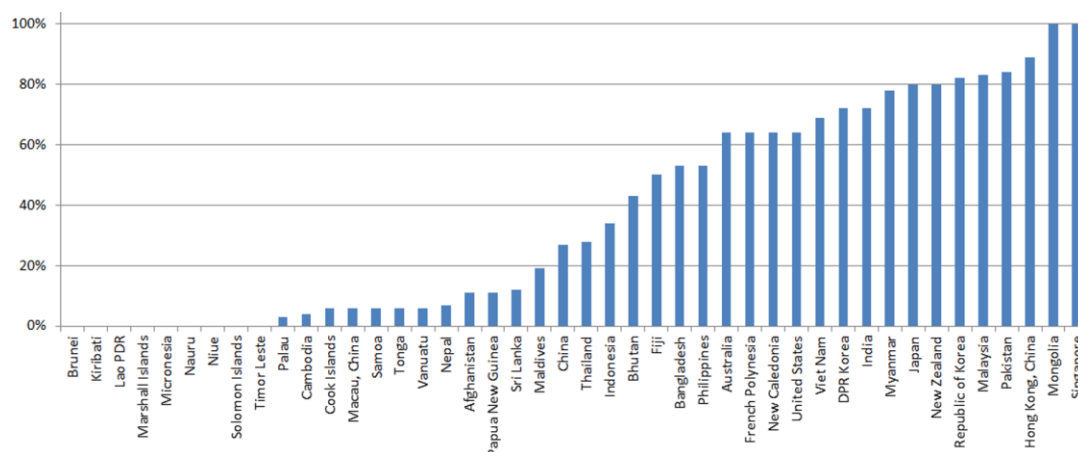


Figure 3.2-3: Regional Phase 1 Implementation Progress



3.2.100 **Figure 3.2-4:** Regional Phase 2 Implementation Progress.

3.2.101 The meeting was again reminded that the implementation steps of Phase 1 of the Roadmap were consolidation steps, i.e. the SARPS for these four steps had been published in Annex 15 many years before the need for transition to AIM arose. The failure of many States to implement these fundamental requirements for the correct functioning of an AIS was a particular concern.

3.2.102 APANPIRG/29 agreed to the following Conclusion:

Conclusion APANPIRG/29/13: ICAO Action to Provide Support and Guidance Material to Facilitate AIS – AIM Transition			
What:	That, ICAO is urged to:	Expected impact:	
	1. provide guidance on the best practice on the establishment of a support team, training and handling of data inconsistencies to facilitate digital eAIP implementation; and	☒ Political / Global	
	2. provide guidance on best practices for implementing AIM Roadmap Phase 3 Steps P-19, P-20 and P-21.	☐ Inter-regional	
		☐ Economic	
		☐ Environmental	
		☒ Ops/Technical	
Why:	To respond to State concerns on the lack of guidance material for aeronautical information exchange and the need for advice on best practices in implementing AIM Roadmap Phase 3 transition steps.	Follow-up: ☐ Required from States	
When:	5-Sep-18	Status:	Adopted by PIRG
Who:	☐ Sub groups ☐ APAC States ☒ ICAO APAC RO ☒ ICAO HQ ☐ Other:		

3.2.103 Noting that, while AIS had a critical interest in the matter of 5LNCs due to the need for AIP amendment, the AIS was not always responsible for their allocation. ATM/SG/6 participants were requested to ensure that their organizations were fully aware of the work that must be undertaken to ensure the global uniqueness of 5LNC, and the impact upon ATC, AIS and other relevant parties.

3.2.104 Information was provided on ICAO's new strategy for the transition of RNP APCH chart identification from RNAV to RNP, issued in Electronic Bulletin (EB) 2018/11 and Circular 353 *Transition Planning for Change to Instrument Flight Procedure Approach Chart Identification from RNAV to RNP*, and arising from Amendment 6 to PANS-OPS Volume II.

3.2.105 ATM/SG/6 had been invited to note the demands that the RNP APCH chart transition will place on stakeholders, such as re-issue of charts (closely coordinated between the State's AIS and charting house), possible changes to automation, software adaptation, training, amendment of aircraft flight manuals, and changes to on-board the multi-function control and display unit (MCDU).

3.2.106 Viet Nam had provided AAITF/13 with information on the continuing existence of NOTAM containing information of permanent validity that had not been transferred to AIP or AIP Supplement (AIP SUP) in a timely manner, overloading pilots with lengthy Pre-flight Information Bulletin (PIB).

3.2.107 The relevant SARPS in Annex 15 and guidance provided in Doc 8126 *AIS Manual* were highlighted, as was the guidance provided in the *Guidance Manual for AIS in the Asia/Pacific Region*.

3.2.108 Therefore, the ATM/SG/6 meeting had agreed to the following Conclusion:

Conclusion ATM/SG/6-14: Management of NOTAMs

3.2.109 AAITF would undertake periodic sampling of NOTAMs, with a view to direct engagement with States responsible for permanent, long duration NOTAM and subsequent reporting to APANPIRG through the Air Navigation Deficiencies list. IATA requested that this issue be escalated to reflect that it was a global problem.

3.2.110 AAITF/13 had agreed that that Version 1.0 of the *Asia/Pacific Regional Plan for Collaborative AIM* be finalized, noting that the information included in the document had been rationalized to take account of the recently increased effort to finalize global guidance, and to avoid any inadvertent divergence. The *Asia/Pacific Regional Plan for Collaborative AIM* included performance expectations aligned with and supporting the performance objectives of the Asia/Pacific Seamless ATM Plan. The meeting agreed to the following Conclusion:

Conclusion ATM/SG/6-15: Asia/Pacific Regional Plan for Collaborative AIM

3.2.111 Hong Kong, China noted there was similarity, as well as potential duplication and inconsistency, of the performance expectations of the *Asia/Pacific Regional Plan for Collaborative AIM* and their associated status reporting elements and the Seamless ATM Plan reporting regime, and in some cases the ICAO Roadmap for Transition from AIS to AIM. The meeting agreed that AAITF should further examine the performance objectives and status reporting elements with a view to future rationalization in this regard of the *Asia/Pacific Regional Plan for Collaborative AIM* and *Seamless ATM Plan*. AAITF should also re-consider the necessity for two levels of implementation reporting.

3.2.112 The ATM/SG/6 meeting had urged ICAO to provide the resources for a harmonized, single portal for reporting implementation of the performance expectations of the Seamless ATM Plan and its supporting, subsidiary plans (*Regional Framework for Collaborative ATFM*, *Regional ATM Contingency Plan*, *Regional SAR Plan* and *Regional Plan for Collaborative AIM*).

Asia/Pacific Search and Rescue Update

3.2.113 ICAO provided an update on Search and Rescue (SAR) for the Asia/Pacific, from the Third Meeting of the Asia/Pacific SAR Workgroup (APSAR/WG/3, Bangkok, 21 – 23 May 2018). APSAR/WG/3 had discussed Circular 347 *Aircraft Tracking Implementation Guidelines* related to the GADSS, as provisions contained in Annex 6, Part I paragraph 3.5 would become applicable on 08 November 2018. IATA stressed that GADSS (and in particular the new tracking requirements) had implementation issues, largely due to the lack of complete guidance material and implementation data.

3.2.114 APANPIRG/29 agreed to the following Conclusion:

Conclusion APANPIRG/29/14: GADSS Aircraft Tracking Requirement			
What:		To support compliance with the Global Aeronautical Distress and Safety System (GADSS) aircraft tracking requirements applicable 08 November 2018 that: a) States should provide information to the ICAO APAC Regional Office where actual Air Traffic Control tracking capability does not meet the GADSS requirements in their area of responsibility, together with a timeline for promulgation of regulatory requirements for airlines to submit requests for variations and exemptions; and b) ICAO HQ be requested to ensure that other ICAO regions affected take action in accordance with a), and consolidate the information to make it available to all aircraft operators and States.	
		Expected impact: ☒ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why:		The action requested is critical to support the GADSS aircraft tracking requirement to ensure airlines (and regulators) have a clear understanding of areas of responsibility, to enable compliance with the requirements applicable from 08 November 2018.	
		Follow-up: ☒ Required from States	
When:		5-Sep-18	
		Status: Adopted by PIRG	
Who:		☐ Sub groups ☒ APAC States ☐ ICAO APAC RO ☒ ICAO HQ ☐ Other:	

3.2.115 The USA had stated that ICAO HQ would need assistance to conduct Job Card Tasks G14 and G15 related to GADSS, and that HQ recognized the ICAO APAC Regional Office as a leader in advancing SAR development.

3.2.116 There were no unresponsive SAR Points of Contact (SPOCs) in the Asia/Pacific Region.

3.2.117 APSAR/TF/3 had discussed the lack of progress in the registration of detected beacons, which had been steady at about 72% for several years. It was considered necessary to closely monitor this issue, and if necessary in future urge States to take stronger action, such as legislation requiring registration, and appropriate enforcement policies.

3.2.118 Implementation of the *Asia/Pacific SAR Plan* was being monitored by an annual survey (**Figure 3.2-5**). A total of 11 States had not yet responded to the survey – Bhutan, Cook Islands, Marshall Islands, Micronesia, Nauru, Palau, Papua New Guinea, Solomon Islands, Timor-Leste, Tuvalu and Vanuatu. ICAO had recalled that APSAR/WG/2 had agreed that States below 90% implementation by 2019 would be considered to have a SAR APANPIRG deficiency at that time.

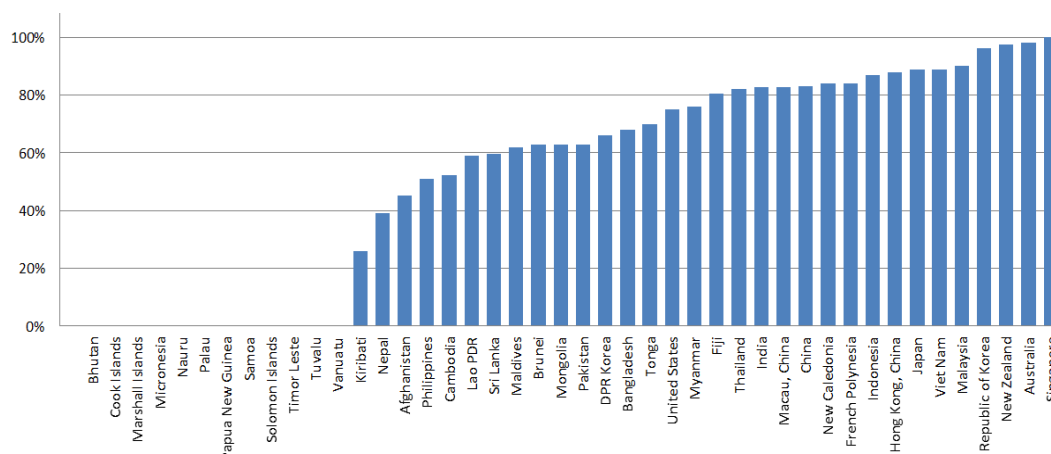


Figure 3.2-5: Asia/Pacific SAR Plan Implementation Status (as at 8 May 2018)

3.2.119 ICAO had sent a survey on one of the 41 *Asia/Pacific SAR Plan* elements causing concern as a result of monitoring – Rescue Coordination Centre (RCC) contingency planning. Administrations were urged to respond to this survey so the region had a clearer understanding of implementation issues.

3.2.120 APSAR/TF/3 had supported the inclusion of SAR in the Global Air Navigation Plan (GANP) as a Basic Building Block (BBB) element. The USA had urged States to submit papers on SAR to the Thirteenth Air Navigation Conference (AN-Conf/13, Montreal, Canada, 9 – 19 October 2018), and for Asia/Pacific States to send SAR experts to the Conference. APANPIRG/29 agreed to the following Conclusion:

Conclusion APANPIRG/29/15: SAR and GADSS in the GANP			
What:	That, Asia/Pacific States are urged to advocate for: a) inclusion of Search and Rescue (SAR) as a Basic Building Block (BBB) and the Global Aeronautical Distress and Safety System (GADSS) functions within the Sixth edition of the Global Air Navigation Plan (GANP) by - i) sending SAR experts; and ii) presenting SAR-related papers to the Thirteenth Air Navigation Conference (Montreal, Canada, 9 – 19 October 2018); and b) greater resources within ICAO HQ to ensure an effective oversight of SAR.	Expected impact:	☒ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why:	APSAR/WG has noted systemic weaknesses in vital SAR focus areas and believes GADSS implementation will take much time and effort to be as beneficial as it should become.	Follow-up:	☒ Required from States
When:	5-Sep-18	Status:	Adopted by PIRG
Who:	☐ Sub groups ☒ APAC States ☐ ICAO APAC RO ☒ ICAO HQ ☐ Other:		

3.2.121 Given the large number of potential changes to the *Asia/Pacific Seamless ATM Plan* in 2019, the meeting agreed to form a Small Working Group (SWG) to review potential amendments with the following **Decision APSARWG/3-3: SAR Plan Amendment Review Small Working Group**.

GADSS Aircraft Tracking Requirements

3.2.122 The USA observed that national SAR services would need to adapt current practices and procedures to manage these new capabilities for GADSS flight tracking and the benefit for SAR, if the data is rapidly available to the aircraft operator, the appropriate ATS unit, and the RCC. IATA

had expressed its concern that States were not ready for the initial GADSS tracking requirements and that awareness would need to be raised at APANPIRG and the DGCA Conference.

Search and Rescue Agreements and Letters of Agreements

3.2.123 The USA discussed the lack of SAR agreements across the Asia/Pacific Region, and recalled several, less formal mechanisms that could be used in lieu of a SAR agreement if format was an issue.

Air Navigation Service Deficiencies List

3.2.124 The List of ANS Deficiencies were discussed, for consolidation into the APANPIRG Deficiency List (presented under **APANPIRG/29/WP15**).

CANSO Standard of Excellence in SMS and SEANS-Safety (WP18)

3.2.125 CANSO highlighted its recently updated version of the CANSO Standard of Excellence in Safety Management Systems (SoE in SMS), which incorporated the latest developments in safety management thinking and practice in accordance Annex 19 *Safety Management*. Also highlighted in the paper was the CANSO Standard of Excellence in ANS–Safety (SEANS-Safety) programme to assess and demonstrate ANSP safety management capabilities (available at <http://www.canso.org>).

3.2.126 Noting that ICAO had voiced concerns regarding the effectiveness of some ANSPs' regulatory oversight, CANSO was trying to address this by developing a recognised SMS maturity assessment for ANSPs. CANSO recognised that achieving the highest level of SMS maturity was a long-term process. The SMS SoE consisted of a system enabler (safety culture) and a framework of five components addressing 16 elements, including safety risk management, safety achievement, safety assurance and safety promotion that encouraged the phased, step-by-step implementation of an SMS.

3.2.127 APANPIRG encouraged ANSPs, whether they CANSO Members or not, to participate in the SEANS-Safety Programme. Noting that IATA shared important safety data under its IOSA programme, the meeting noted that ICAO may discuss the provision of SoE in SMS data to ICAO with CANSO.

Global Aeronautical Distress and Safety System (IP07)

3.2.128 The USA requested APANPIRG/29 participants to note that two Draft Conclusions from the ATM/SG/6 and the U.S. working paper submitted for the Thirteenth Air Navigation Conference (ANC/13, 09 – 19 October 2018) discussed issues pertaining to the implementation of the GADSS functions for aircraft tracking.

Enhancing Airspace Capacity through the Phased Implementation of AIDC Operation and Reduced Longitudinal Spacing within the Hong Kong FIR (IP08)

3.2.129 Hong Kong, China presented information on its planned phased implementation of enhanced longitudinal spacing and implementation of AIDC operations. This was expected to improve airspace utilisation to accommodate more traffic at optimum flight levels, and minimise the adverse effects on the environment by civil aviation activities.

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

3.3 RASMAG Report

RASMAG Outcomes

3.3.1 The Seventh Meeting of the Future Air Navigation Services (FANS) Interoperability Team – Asia (FIT-Asia/7) was held in Bangkok, Thailand, from 11 – 13 December 2017. FIT-Asia/8 was also held in Bangkok, from 26 to 29 June 2018.

3.3.2 The Twenty-Third Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/23) was held from 02 – 05 July 2018 at Bangkok, Thailand. A total of 58 participants attended RASMAG/23 from Australia, Bangladesh, Cambodia, China, Hong Kong China, Fiji, India, Indonesia, Japan, Malaysia, Nepal, New Zealand, Philippines, Republic of Korea (ROK), Singapore, Sri Lanka, Thailand, United States, Viet Nam, IATA, IFALPA and ICAO. A total of 33 Working Papers (WPs), five Information Papers (IPs) and three flimsies were presented to RASMAG/23.

PBCS Readiness

3.3.3 Despite two APANPIRG Conclusions urging States to take action and to report implementation status it was unclear why many aircraft could not file PBCS indicators in flight plans. This would mean a ‘mixed-mode’ environment in Performance-Based Communications and Surveillance (PBCS) airspace that could require considerable effort from ATC to minimize the impact on operations.

3.3.4 The following Asia/Pacific States had reported implementing PBCS operations in their Flight Information Regions (FIR)s, and were completing, in full or in part, the regulatory processes supporting aircraft operator readiness for PBCS:

- **PBCS FIRs:** China, Fiji, Indonesia, Japan, New Zealand, Singapore, USA.
- **Aircraft Operator Readiness:** China, Japan, New Zealand, Singapore, USA.

3.3.5 The FIT/-Asia/8 meeting had drafted the following Conclusion, which was subsequently agreed by RASMAG/23:

Conclusion RASMAG/23-1: PBCS Compliance

3.3.6 The FIT/-Asia/8 meeting had noted that several Asia/Pacific States may have implemented, or planned to implement, performance-based separations in airspace over the high seas without the necessary support in SUPPS. States were requested to notify the ICAO Asia/Pacific Regional Office in this regard, to facilitate a coordinated Proposal for Amendment (PfA) that would avoid piecemeal amendments to SUPPS.

3.3.7 The FIT/-Asia/8 meeting had also noted that, while the reporting of performance data to the FIT had improved, there was little reporting of the actions taken by States to determine the causes of performance not meeting the criteria, or of actions taken to rectify performance deficiencies. States were requested to ensure that all cases of significant failure to meet the performance criteria were acted upon, and that the results of analysis of contributing factors and the rectification action taken by the State were reported to the FIT.

3.3.8 Where monthly performance analyses, or analysis of information provided by ATC, operators themselves or other sources, identified deficiencies in the data link performance of a particular operator, or operators, States should report the issue to the Central Reporting Agency (CRA) for analysis. Further reporting to the Regional Monitoring Agency (RMA) and/or Regulator should follow, as appropriate. It was noted that apparent operator issues may also be related to communications network issues such as transitions between satellite and VHF communications, therefore requiring full analysis before reporting to RMA and/or regulator.

Aggregated Regional Data

3.3.9 The FIT/-Asia/8 meeting had recommended that aggregated regional data link performance data should be made available. The responsibility for compiling the data and reporting it to the FIT should be assigned on a rotational basis. FIT/-Asia/8 had drafted the following Conclusion, which was subsequently agreed by RASMAG/23:

Conclusion RASMAG/23-2: PBCS Action List for ANSPs

Regional PBCS Monitoring Templates

3.3.10 New Zealand had presented the format of PBCS monitoring templates agreed at the April 2018 Informal South Pacific Coordinating Group (ISPACG) FIT meeting. These templates standardized reporting of observed RCP240 and RSP180 performance by ISPACG ANSP to the ISPACG FIT. The paper also proposed monitoring templates for use by regional groups such as ISPACG and FIT/Asia when reporting FANS1/A data link performance to their appropriate coordinating group and RASMAG.

3.3.11 As several FIT-Asia States had only recently commenced data link performance analysis, it was proposed that FIT-Asia supported a phased implementation of the new templates. FIT/-Asia/8 had drafted the following Conclusion, which was subsequently agreed by RASMAG/23:

Conclusion RASMAG/23-3: Data Link Performance Analysis Reporting Templates

PBCS Approvals Database

3.3.12 The RASMAG/23 meeting had agreed that the template for ANSP reporting PBCS performance below the criteria would be useful for standardizing the information provided to RMAs and States. FIT/-Asia/8 had drafted the following Conclusion, which was subsequently agreed by RASMAG/23:

Conclusion RASMAG/23-4: PBCS Non-Compliance Report Form Template

3.3.13 RASMAG/23 Outcomes

Vertical Safety Assessment

3.3.14 **Figure 3.3 – 1** is a summary of Asia/Pacific Reduced Vertical Separation Minimum (RVSM) Target Level of Safety (TLS) compliance reported to RASMAG/23.

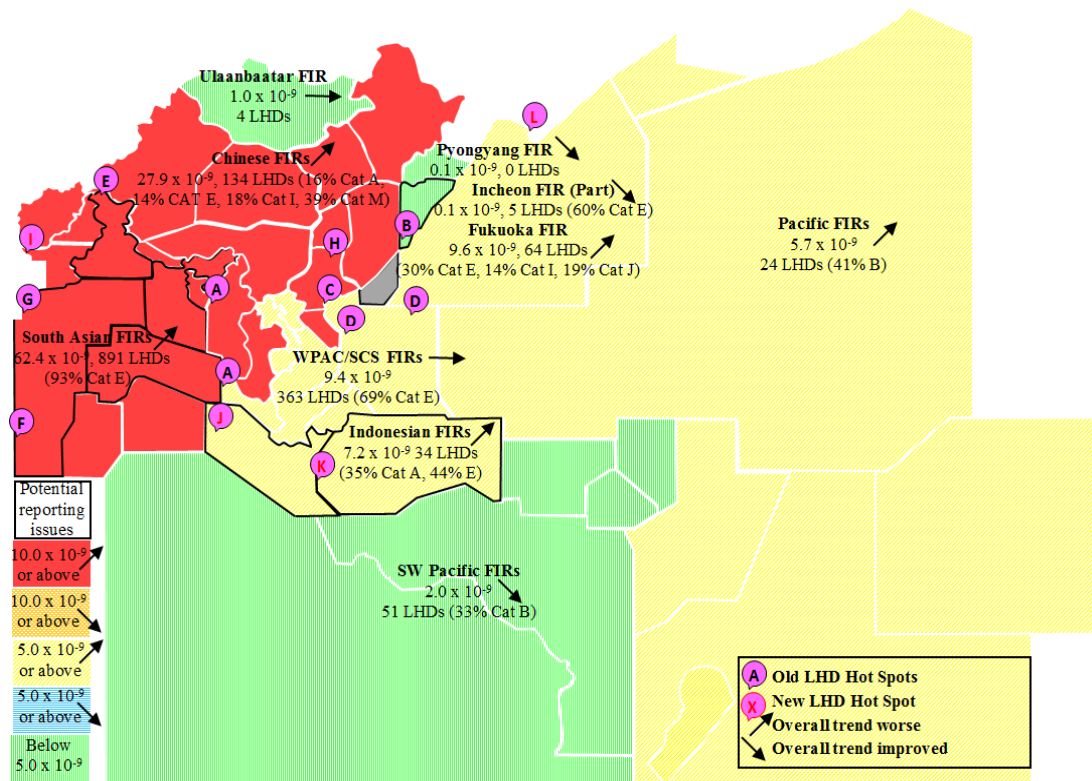


Figure 3.3 - 1: Asia/Pacific RVSM TLS compliance reported to RASMAG/23

3.3.15 **Table 3.3 – 1** provided a comparison of Asia/Pacific RVSM risk as a measure against the TLS by grouped FIRs, according to the RMA responsibilities for airspace. Over the past five years (2013 – 2017), the performance of Asia/Pacific in compliance with the TLS for RVSM had been poor overall, averaging 34% when measured by the grouped FIRs.

	RASMAG19	RASMAG20	RASMAG21	RASMAG22	RASMAG23
FIRs	16%	53%	32%	51%	16% (8 FIRs)

Table 3.3 – 1: Comparison of Regional RVSM TLS Achievement

South Asian/Indian Ocean Airspace

3.3.16 In summary, the estimated vertical risk for the South Asia/Indian Ocean area had increased substantially from 27.8×10^{-9} to 62.4×10^{-9} (**Figure 3.3 – 2**), or more than an order of magnitude higher than the TLS. Negative transfer cases had accounted for 45% of occurrences but 63% of the risk. Urgent work was being undertaken by all the States concerned to implement improved Air Traffic Services (ATS) surveillance and communications, including ATS Inter-facility Datalink Communications (AIDC), and enhanced operational procedures to reduce this risk.

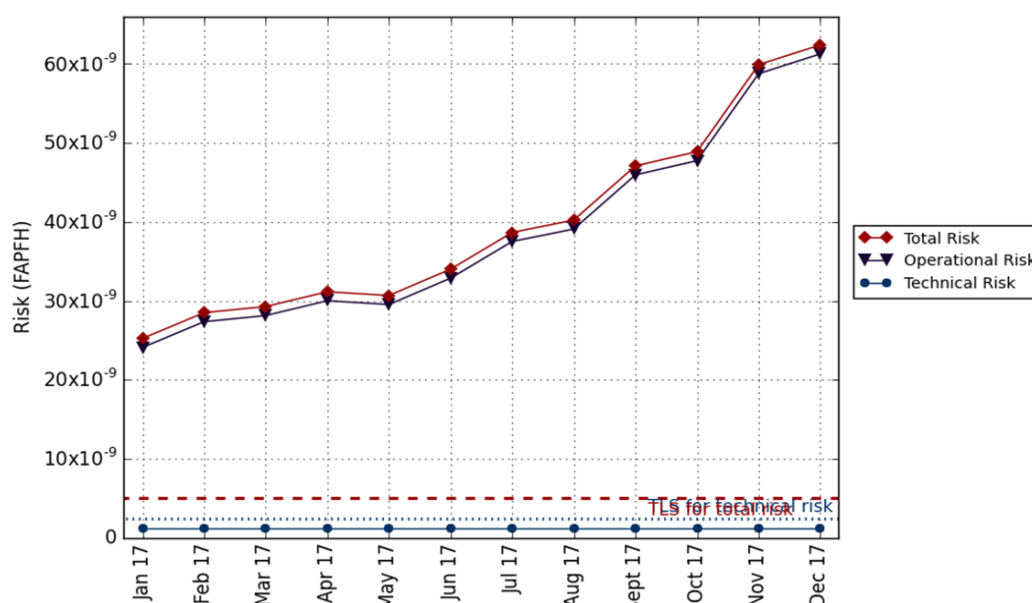


Figure 3.3 - 2: South Asia/Indian Ocean Airspace RVSM Risk Estimate Trends

Southeast Asia

3.3.17 The Western Pacific/South China Sea (WPAC/SCS) area overall risk estimation was unchanged from 2016 to 2017 (9.4×10^{-9} , Figure 3.3 - 3).

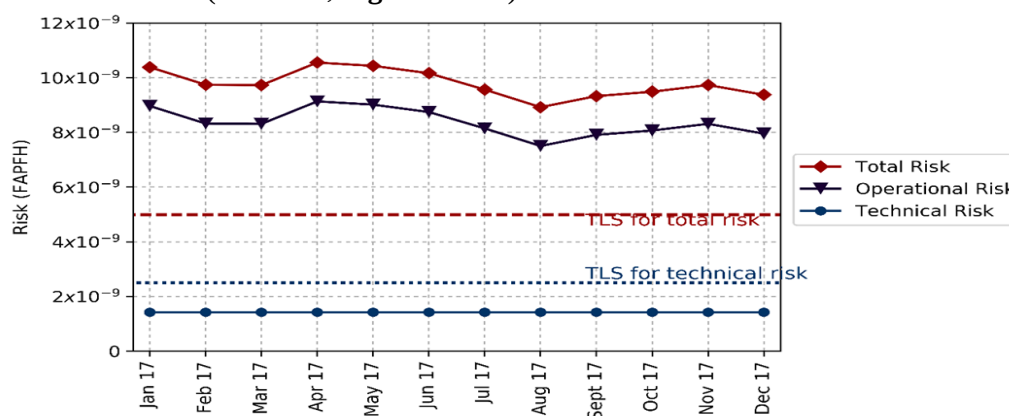


Figure 3.3 - 3: WPAC/SCS Airspace RVSM Risk Estimate Trends

3.3.18 Hot Spot D – the Manila FIR interface with the Ujung Pandang, Singapore, Ho Chi Minh, Sanya, Hong Kong and Fukuoka FIRs remained problematic, although a reduction of Large Height Deviations (LHDs) was noted from 96 in 2016 to 62 in 2017. The implementation of AIDC had been previously urged as a high priority, but was not yet fully operational. The Philippines had described an extensive ATC modernisation programme that was due to be implemented mainly during the second half of 2018. IFALPA asked about specific timelines for implementation. The Philippines stated that they were currently in a shadowing phase and planned to cutover in August 2018 if the system provider could fix all the issues.

3.3.19 RASMAG/23 also noted the workload [and therefore safety] issues with the continued requirement to transition to a non-standard Flight Level Orientation Scheme (FLOS) in the South China Sea (SCS). ICAO noted that the SCS Traffic Flow Review Group (SCSTFRG) managed this task, and requested China, Hong Kong China and Viet Nam to resolve this issue as soon as possible.

East Asia

3.3.20 The Incheon FIR AKARA Corridor interface with Shanghai/Fukuoka/Taipei FIRs had been identified by RASMAG/20 as an LHD Hot Spot (**Hot Spot B**) with the Pacific Approvals Registry and Monitoring Organization (PARMO), China RMA, Japan Airspace Safety Monitoring Agency (JASMA), and Monitoring Agency for the Asian Region (MAAR) as the assigned RMAs (**Figure 3.3 - 4**).

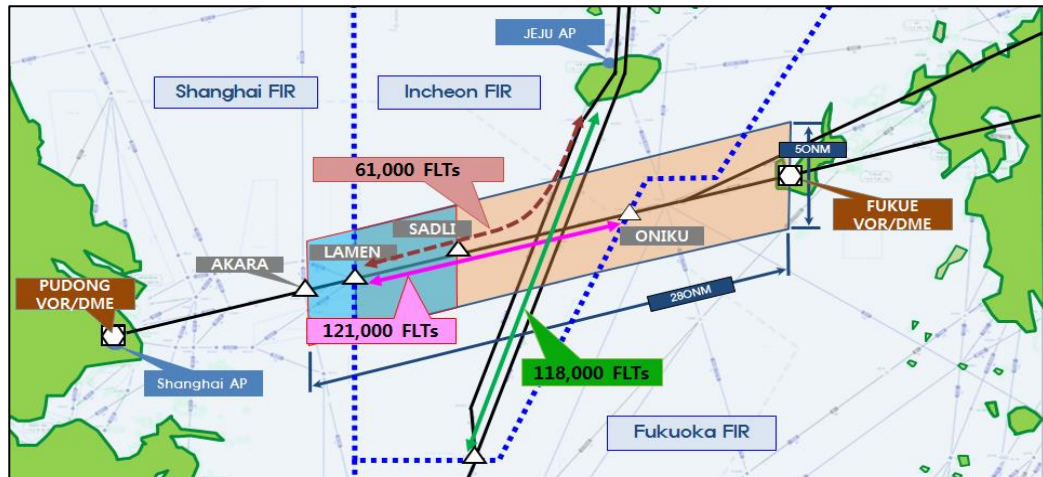


Figure 3.3 - 4: AKARA Corridor Overview

3.3.21 The 2017 safety assessment for AKARA noted that a single deviation of only 9.25 seconds in a year would be enough to fail the TLS, due to the AKARA arrangements being non-compliant with ICAO Standards. The ROK provided operational information on the AKARA Corridor. A review had been conducted, and a safety assessment had been initiated regarding an AKARA Corridor ATC sector.

3.3.22 IATA thanked PARMO and ROK for providing the information on operations within the AKARA Corridor, which had a significant effect on safety and efficiency. IATA continued to be concerned about the abnormal arrangements, particularly if there was an emergency descent or a deviation required. Recognising that the arrangement was set up due to the lack of infrastructure 35 years ago, IATA noted that this was not the case today. Moreover, IATA stated that while the airlines supported short-term mitigation actions, the focus must remain on having one ATC unit providing the services within one airspace.

3.3.23 The Fukuoka FIR's vertical safety estimate indicated an increased risk from 9.2×10^{-9} in 2016 to 9.6×10^{-9} in 2017, although much of this risk originated from the Manila FIR (**Figure 3.3 - 5**). Of significance were the continued incidence of turbulence-related Category I LHDs south and southwest of Japan (*note: RASMAG/21 had suggested an emphasis on special meteorological forecasting*).

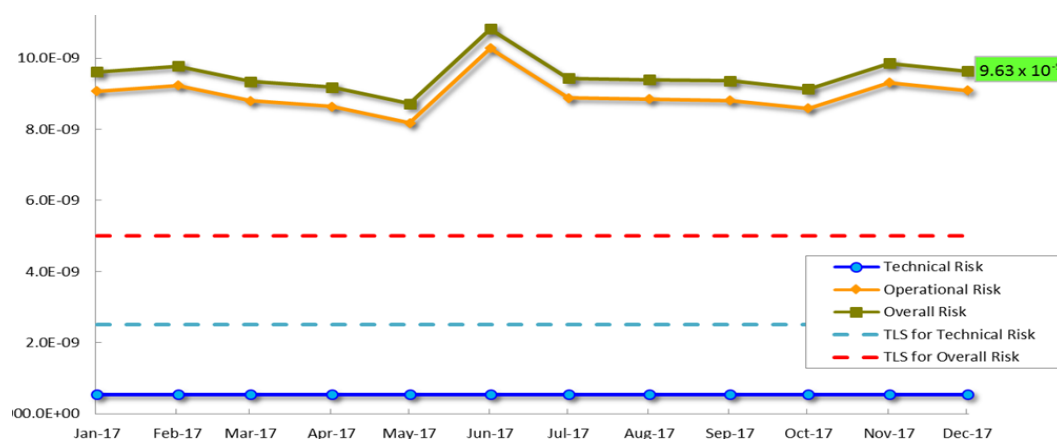


Figure 3.3 - 5: Fukuoka FIR RVSM Risk Estimate Trends (2017)

3.3.24 Chinese FIRs had experienced a major increase in estimated risk, from 4.7×10^{-9} in 2016 to 28.0×10^{-9} in 2017 (**Figure 3.3 - 6**). The main change was a large increase in Category M ('Other') LHDs from 13 to 52, and the number of LHDs overall increased from 117 to 134. However, RASMAG had previously noted that China RMA had embarked on a major education programme in China's ACCs, which was inevitably providing an improved reporting environment, and thus more safety reports.

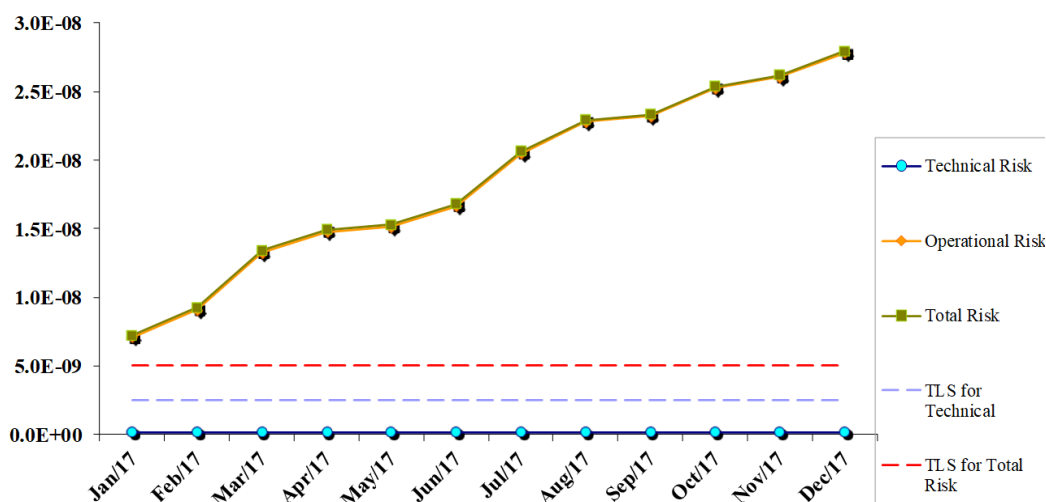


Figure 3.3 - 6: Chinese FIRs RVSM Risk Estimate Trends (2017)

3.3.25 Regarding **Hot Spot E** on the Urumqi/Lahore FIR interface, China was continuing to work with Pakistan to improve the surveillance and communication situation, and the number of LHDs had reduced from 21 in 2014 to 6 in 2017.

3.3.26 The number of LHDs at **Hot Spot C** (Hong Kong FIR – Guangzhou/Sanya FIRs interface) and at **Hot Spot H** on the Guangzhou/Wuhan FIR interface had reduced, indicating the use of positive operational measures by China.

Pacific

3.3.27 The Central and South Pacific areas marginally did not achieve the TLS, with an increasing trend to 5.7×10^{-9} . There had been almost no change in the number of LHDs since 2016, but a cluster of Category B events in the Central East Pacific (CEP) area had contributed to the increased risk. In addition, the South Pacific – East Asian traffic flow LHDs accounted for 76 minutes of time spent at incorrect flight level, which is more than 28% of the time spent at incorrect flight levels for Pacific airspace in 2017.

3.3.28 According to the Australian Airspace Monitoring Agency (AAMA), the Southwest Pacific (including Australian airspace) achieved TLS in 2017 at 2.0×10^{-9} , with an improving trend.

Hot Spots

3.3.29 **Table 3.3 – 2** provides a summary of the LHD Hot Spots.

Hot Spot	Involved FIRs	RMAs/Date	Remarks
A1	Kolkata/Dhaka – Yangon;	MAAR/2015	LHDs reducing, AIDC Chennai – Kuala Lumpur
A2	Chennai – Kuala Lumpur	MAAR/2015	
B	Incheon	PARMO/2015	AKARA Corridor
C	Hong Kong – Guangzhou/Sanya	C-RMA/2015	LHDs reducing
D	Manila – all adjacent FIRs	MAAR/2015	LHDs reducing
E	Lahore – Urumqi	C-RMA/2015	LHDs reducing
F	Mogadishu – Mumbai	MAAR/2015	LHDs reducing
G	Sana'a/Muscat – Mumbai	MAAR/2015	LHDs increasing (Cat E)
H	Guangzhou – Wuhan	C-RMA/2015	LHDs reducing
I	Karachi – Kabul	MAAR/2018	Major, Category E LHDs
J	Jakarta – Singapore	AAMA/2018	Minor, Category E LHDs
K	Jakarta – Ujung Pandang	AAMA/2018	Minor, Category E LHDs
L	Fukuoka – Khabarovsk	JASMA/2018	Minor, Category E LHDs

Table 3.3 – 2: Comparison Summary of LHD Hot Spots

RASMAG Safety Bulletins

3.3.30 The RASMAG Chair had presented drafts of the first RASMAG Safety Bulletins as discussed by RASMAG/22, for consideration by the meeting. IATA congratulated the MAAR as this built on the work of RASMAG to take initiatives intended to fix safety issues. IATA had noted that the draft Bulletins needed further refinement, and could include regional information like hot spots. RASMAG/23 had agreed to the following Conclusion:

Conclusion RASMAG/23-5: RASMAG Safety Bulletins

Non-RVSM Approved Aircraft

3.3.31 The highest number of aircraft from Asia/Pacific States that had been observed for a significant length of time by the RMAs were from India (16, MAAR), USA (15, NAARMO) and Australia (8, AAMA). The meeting noted that the dramatic reduction of non-RVSM airframes detected could be attributed to the effort of all RMAs, and Conclusion APANPIRG/28/12 *Management of Non-RVSM Aircraft*. A survey of Asia/Pacific States had been conducted by ICAO on the management of non-RVSM aircraft, related to Conclusion APANPIRG/28/12.

RMA Monitoring Burden

3.3.32 All RMAs except the MAAR and PARMO had been either reducing their monitoring burden or the burden was relatively stable, with the overall Asia/Pacific burden reducing by 44.1% from 2014 (428 to 295). The MAAR burden now constituted approximately 57% of the Asia/Pacific's total, so the States it served needed to take increased action to ensure aircraft were monitored in accordance with Annex 6 requirements.

3.3.33 ICAO recommended that States failing to meet monitoring obligations with a burden of 30% or more airframes should be considered an APANPIRG Deficiency, which was agreed by the meeting. This may assist the MAAR, which had all but one of these States as part of its responsibility.

Horizontal Safety Report

3.3.34 All Asia/Pacific En-Route Monitoring Agency (EMAs) reported that the horizontal risk assessments had met the TLS of 5.0×10^{-9} .

Safety Reporting

3.3.35 An analysis by RASMAG/23 of estimated flight hours and the number of reported LHDs had suggested that the Asia/Pacific had a range of reporting cultures, although the ratio of LHDs/flight hours could not be viewed as a direct indicator in isolation, as some operating environments were more complex and others more prone to air safety incidents.

3.3.36 South Asia (South Asia and Indian Ocean) airspace was an example of the latter, which had an increase in the number of LHD reports; yet there was still a significant lack of LHDs reported, especially within the Delhi FIR. Therefore, the meeting noted that it was appropriate to remind States, even those which had taken significant positive steps to improve reporting, and especially those such as India, ROK and Indonesia where safety reporting issues had been noted for some years, 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*.

RASMAG Effectiveness

3.3.37 RASMAG/23 had noted that over the last decade, safety reporting had increased markedly in several parts of the Asia/Pacific due to RASMAG's efforts through the RMAs, which had resulted in a more correct safety picture emerging. The most dramatic increase had occurred in the South Asia/Indian Ocean airspace (**Figure 3.3 - 7**). RASMAG recognised that since 2012 (when safety reporting was first raised by ICAO), important safety mitigation actions had been implemented as a result.



Figure 3.3 - 7: South Asia/Indian Ocean Estimated Vertical Safety Risk (2007 – 2017)

RASMAG ANS Deficiencies

- 3.3.38 RASMAG/23 had reviewed the airspace safety-related APANPIRG Deficiencies.

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

3.4 CNS Matters

3.4.1 APANPIRG/29 reviewed the outcomes of the Twenty Second Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/22) of APANPIRG held at the ICAO Regional Office, Bangkok, Thailand, from 16 to 20 July 2018 (WP/12). The meeting noted with appreciation the work done and achievements by the SG and the contributory bodies reporting to APANPIRG through the SG. The meeting discussed CNS related matters and took following actions on the report of CNS SG/22 and other papers presented under Agenda Item 3.4.

3.4.2 The meeting noted that Mr. Amit Kumar Banerjee, Executive Director (CNS-OM), Airports Authority of India, was elected as Vice Chairman of the CNS Sub-group. The full report of the SG and other meeting document were posted on the following webpage: <https://www.icao.int/APAC/Meetings/Pages/2018-CNS-SG22.aspx>

3.4.3 The meeting also noted that the SG had adopted a number of regional guidance materials, updated implementation plans, VoIP ICD, Catalogue and Routing Directory through the following (1) Decision and eight (8) Conclusions in accordance with APANPIRG Decision 26/65 that empowered the Sub-groups to adopt Conclusions and Decisions on technical matters:

Conclusion CNS SG/22/2	- Arrangement for Conducting IP Connectivity Test
Conclusion CNS SG/22/3	- CRV Implementation Plan and VoIP ICD
Conclusion CNS SG/22/4	- ATN/BBIS Administrations Use CRV for AFTN/AMHS Traffic
Decision CNS SG/22/5	- Revised Terms of Reference for the SWIM TF
Conclusion CNS SG/22/6	- Asia/Pacific SWIM Survey
Conclusion CNS SG/22/7	- Updated AFTN/ATSMHS Routing Directory
Conclusion CNS SG/22/11	- The Catalogue of Asia and Pacific Flight Inspection and Flight Validation Service Providers
Conclusion CNS SG/22/15	- Revised ADS-B Implementation and Operations Guidance Document (AIGD)
Conclusion CNS SG/22/17	- Amendment of Asia/Pacific Seamless ATM Plan Version 2

3.4.3.1 The Conclusion CNS SG/22/17 on the Amendment of Asia/Pacific Seamless ATM Plan was adopted by CNS SG/22 also endorsed by the ATM SG/6 meeting. It was considered important to highlight the changes to State planners through a Conclusion although amendment to the Asia/Pacific Seamless ATM Plan may not require for an APANPIRG Conclusion.

Aeronautical Fixed Service (AFS)

3.4.4 The Fifth Meeting of the Aeronautical Communication Services Implementation Co-ordination Group (ACSICG/5) of APANPIRG was held in Bangkok in June 2018. The full report of the meeting is available at: <https://www.icao.int/APAC/Meetings/Pages/2018-ACSICG5.aspx>

3.4.5 The meeting noted the ATN/AMHS/AIDC implementation status in the APAC Region provided in Appendix A to CNS SG/22 meeting report.

Air Traffic Service Message Handling Service (AMHS) over IPS

3.4.6 The BBIS and BIS Administrations were encouraged to use IPS routers for AMHS connections. As the APAC Region moving forward to utilize the Common aeronautical Virtual Private Network (CRV), Multi-Protocol Label Switching (MPLS) will be the primary routing protocol for the network. Thus, ATN router's IDRP function will be disabled. BBIS Administrations should connect with each other using IPS router when CRV is utilized. The meeting recommended to gradually phase out the use of ATN router to reduce operational cost while improving service restore time as less equipment are involved. The meeting adopted the following Conclusion:

Conclusion APANPIRG/29/16: Using IPS Routers between BBIS Administrations	
What: That, utilize IPS router and encourage to phase out X.25 and IP SNDCF (ATN) router by allowing IPS routers to inter-connect between BBIS Administrations when CRV or other inter-regional IP networks being utilized.	Expected impact: ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Compliance with ICAO Doc. 9896	Follow-up: ☒ Required from States
When: 5-Sep-2018	Status: adopted by PIRG
Who: ☒ APANPIRG ☒ APAC States ☐ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

ATSMHS Transition from X.25 Protocol to IP Suites

3.4.7 CRV network provides IP interface only which requires change from the existing AMHS connections with X.25 protocol to the IP network protocol. For existing AMHS connections over X.25 (ATN Router) that IP connectivity test had not been conducted previously, additional IP link connectivity tests shall be carried out before migration from X.25 to IP protocol when joining the CRV. These additional tests shall be supplemented in the TMC. Accordingly, the CNS SG/22 meeting adopted **Conclusion CNS SG/22/2 on Arrangement for Conducting IP Connectivity Test.**

AMHS FTBP for MET IWXXM Data

3.4.8 The ACSICG meeting took a note of the report of AFSG/22 meeting on AMHS FTBP for MET IWXXM data and considered the following three issues:

- 1) Security: MET User has to make arrangement for scanner, screener or filter. Attachments to AMHS as a FTBP could be attacked with virus or malware.
- 2) Bandwidth: by analyzing the AMHS User capability and its potential bandwidth requirement, IWXXM attachment as FTBP would result in fivefold increasing of bandwidth when compared to legacy format - TAC. TAC will be continued to be distributed in addition to IWXXM distribution. Thus, the bandwidth requirement from MET generated system to AMHS will be six times larger than current requirement.
- 3) AMHS User capability: need for IWXXM generated systems to be registered with AMC. States/Administrations are required to verify with AMC before distribute IWXXM data. This is a critical step to ensure the readiness of the service.

Support for the exchange of IWXXM formatted MET data via AMHS

3.4.9 New Zealand MetService had established a Disaster Recovery (DR) centre in Auckland. This DR centre uses a P3 AMHS connection to the Airways AMHS system. Testing of the Melbourne AMHS connection to the Airways Development AMHS system included the exchange of attachments in the form of File Transfer Body Parts (FTBPs). The NZ MetService is positioned for the exchange of Meteorological (MET) data in IWXXM format via AMHS.

CRV OG/3

3.4.10 The Third Meeting of the Common aeRonautical VPN Operations Group of APANPIRG was held from 18 to 20 December 2017 in Bangkok.

3.4.11 The main achievements of CRV OG/3 meeting are listed below:

- The transition period to CRV from 2018 to 2020 should be harmonized between stakeholders to achieve the benefits of CRV implementation;
- Confirmed CRV Pilot Project Test Plan/Pilot Service Acceptance Testing;
- Technical Trial on APAC CRV was successfully conducted by Hong Kong China and Thailand in December 2017 to verify its operational readiness;
- Synchronized the starting and ending dates of CRV contract commencing 1 January 2018 and would end on 31 December 2023 for the initial 5-year period and plus 5 one-year term option. Any States join after 31 December 2023, the CRV program needs to be approved by mutual agreement between ICAO/CRV OG and PCCW Global. Additional charges may be incurred for the new users and the minimum contract commitment should be no less than 12 months;
- Final review of the CRV engineering package; and
- COM centres in APAC Region may connect with Khabarovsk and/or with Irkutsk centres via CRV.

CRV OG/4

3.4.12 The Fourth Meeting of the Common aeRonautical VPN Operations Group was held from 18 to 20 April 2018 in Fiji. A CRV Workshop focusing solution for Pacific States was conducted on 16-17 April 2018.

3.4.13 The main achievements of CRV OG/4 meeting are listed below:

- Noted that a mini CRV workshop was conducted in March 2018 in Cairo. Coordination for CRV implementation with MID Region would be further discussed at the CRV OG/5;
- The meeting discussed the procedure to accommodate additional potential partners to join CRV and agreed that new applications outside of CRV operation concept need to be approved by CRV OG;
- Noted the SWIM TF/2 outcomes and the requirement for communication infrastructure including CRV to support SWIM. The meeting considered that

there is a need to provide more information back to the SWIM Task Force on the purpose of the CRV. The CRV will be uniquely placed to be able to provide private IP (not public internet) connections between States for the exchange of SWIM. CRV OG requested that the SWIM Task Force engages the OG to further discuss the communications infrastructure requirements. It may be beneficial to conduct the CRV OG and the SWIM Task Force at the same time so that a constructive conversation can be achieved. The meeting also noted the need to develop an initial Architecture for SWIM and urged the SWIM Task Force to engage with the CRV OG to work towards ensuring that viability of the CRV to carry SWIM;

- CRV pilot project had been further delayed. The meeting urged States involved with pilot project for Proof of Concept take all efforts working together with PCCW Global to complete the pilot project as early as possible;
- made progress of the CRV Pilot Project Test Plan/Pilot Service Acceptance Testing for the confirmation of key aspects of the CRV network; and
- States/Administrations were requested to note the proposed changes to (a)-1 Terms and Conditions between PCCW Global and CRV User and to review the proposed contract end dates amendments with their legal teams.

CRV Implementation Plan and VoIP and Analog Voice ICD for CRV

3.4.14 The meeting noted the CRV Implementation Plan endorsed by the ACSICG. The plan serves as guidance for States/Administrations who wish to join the CRV. The CRV implementation roadmap, implementation requirements and stakeholders' (CRV members and CRV service provider) responsibilities etc. are contained in the plan. The updated 'National CRV Points of Contact', 'Local CRV Points of Contact' had been included in the Plan.

CRV Voice over Internet Protocol (VoIP) and Analog Voice ICD

3.4.15 The VoIP ICD was developed as a companion to the IP ICD to include VoIP and Analog Voice interfaces for voice access to CRV. The VoIP and Analog Voice ICD will be useful as a guideline for Ground to Ground Voice communications. The CNS SG/22 endorsed **Conclusion CNS SG/22/3 for CRV Implementation Plan and VoIP ICD** formulated by CRV OG/4 meeting.

Transition from Point-to-Point BBIS & BIS State to CRV Network connection

3.4.16 Based on a proposal from Fiji and ACSICG, BBIS States/Administration were encouraged to commence the transition of AMHS to CRV network as early as possible to allow more BIS States/Administration to establish connections over CRV. Hong Kong China proposed and the meeting agreed to follow up the following topics from a regional perspective:

- 1) A need to review the Router Routing in CRV;
- 2) A need to review how to determine outage between two locations using CRV; and
- 3) A need for BBIS States/Administration to review their CRV transition plan with respective BISs and keep the ICAO posted with a view to implement IWXXM in the APAC by 2020.

The Secretariat will bring up these items in the next CRV OG/5 meeting to be hosted in Hong Kong, China in January 2019 for follow-up actions. Accordingly, the meeting adopted **Conclusion CNS SG/22/4 for ATN/BBIS States/Administration Use CRV for AFTN/AMHS Traffic.**

IPv4 and IPv6 planning

3.4.17 As the IPv4 address is depleting and would not sustain the Air-to-Ground communication that will be based on Internet Protocol Suite (IPS). It was noted that ARINC Standards for airborne equipment and air-ground interoperability currently are based on IP Version 4 (IPv4) (e.g. ARINC 664, ARINC 822A, etc.). IP Version 6 (IPv6) deployment now is growing around the world. Around 25% of worldwide traffic is now full IPv6 (end 2017) against less than 1% 5 years ago (end 2012). The AEEC IPS Subcommittee develops some steps of the proposed approach as mentioned in the paper.

IPv4 Address in the CRV Implementation Plan

3.4.18 The ACSICG reconfirmed the use of APAC IPv4 addresses placed at the Appendix B to CRV Implementation Plan. When adopted the IPv4 address assignment, it was not clearly specified the address is designated for State, ANSP, Service provider (e.g. CRV provider), or for AMHS. Therefore, the meeting agreed that the designated IPv4 address will be assigned for CRV Customer Edge (CE) router as proposed by ACSICG. This would allow ANSPs who subscribed service with CRV can share the service with their respective applications (e.g. AMHS, AFTN, ADS-B, AIM and SWIM) as needed.

Second Meeting of the APAC SWIM Task Force

3.4.19 The meeting noted the outcomes of the Second Meeting of the APAC SWIM Task Force (SWIM TF/2) which was held in Bangkok from 9 to 12 April 2018.

3.4.20 The meeting noted the progress and updates made by tasks leaders on the assigned tasks, and further follow up action items against each task. The meeting also noted the needs for SWIM education identified by the SWIM Task Force.

3.4.21 Considering the nature of Task Force work plan and the statements of work developed, the meeting agreed to the revised TOR of SWIM Task Force. The main changes in the TOR are the report path directly to the CNS Sub-group rather than through ACSICG. Consequential changes to the list of coordinating bodies in the Region listed in the TOR. In any case, a specific task of the SWIM Task Force has been designed to perform the horizontal coordination with all the TF/WG under APANPIRG which have a contribution to or a dependency on the SWIM implementation. Accordingly, the meeting made **Decision CNS SG/22/5 on the Revised Terms of Reference for the SWIM Task Force.**

Survey on Implementation of APAC SWIM Services

3.4.22 The meeting noted the proposed survey (part of Task 2-1-1) to support the work of SWIM Task Force and the future planning of SWIM services in the APAC Region. The purpose of the survey is to invite States to provide information on new services being implemented and/or to be implemented. The result of the survey would be useful for determining services which should be implemented with higher priority and for building SWIM service catalog in APAC region.

3.4.23 As the revised draft on SWIM survey was still under review, the Chairman suggested the SWIM TF to review the draft through proper channels to formalize the review process from SWIM Task Force. The survey placed in Appendix E to CNS SG/22 meeting report should be

distributed to States and shared with stakeholders in different fields including international organizations to evaluate the SWIM services when it is circulated through an ICAO State letter. The meeting adopted **Conclusion CNS SG/22/6 for Asia/Pacific SWIM Survey** and urged States to respond the survey.

AIDC Implementation Task Force

3.4.24 The meeting noted that the APA Task Force updated the AIDC implementation priorities against the hot-spot identified by RASMAG and APANPIRG. The progress and target dates of implementation are highlighted below:

- Jakarta and Chennai - Oct. 2019;
- Jakarta and Ujung Pandang - Oct. 2019;
- Jakarta /Melbourne FIRs - Oct. 2019;
- Chennai and Kuala Lumpur - implemented on 15 May 2017 with a limited set of messages and LOA to be signed soon;
- Manila and Fukuoka - coordination in progress;
- Manila and Taipei - 4Q2018;
- Manila and Hong Kong - 1Q2019;
- Manila and Ho Chi Minh - 1Q2019;
- Manila and Singapore - 4Q2018;
- Manila and Kota Kinabalu - 4Q2019;
- Manila and Ujung Pandang - 4Q2018;
- Urumqi/Lahore - New IDD service provider selected by Pakistan and communication being improved and LHD reduced;
- Beijing/Ulaanbaatar - coordination is underway for testing and implementation;
- Hong Kong/Guangzhou - AIDC in operation since May 2018; and
- Mumbai/Karachi and Muscat – coordination is underway for implementation and Mumbai side is ready (new hot-spot 1 identified by RASMAG/22).

3.4.25 The meeting also noted that a Proposal for Amendment (PfA) to ANP Table CNS II APAC-1-AIDC Implementation Plan to reflect the latest requirements for AIDC implementation had been processed through a consolidated PfA with serial No.: APAC-II 18/01 - CNS-MET/AIM with ref: AN 3/3 - AP005/18 (CNS/MET/AIM) dated 30 January 2018. States/Administrations were notified of the approval in June 2018 with the AIDC implementation plan which was further updated by APA TF/4 meeting.

3.4.26 The meeting noted that the AIDC Task Force had collected and analysed a number of implementation issues classified into categories with recommended solutions. The meeting noted some recommended solutions to the identified issues. For the AFTN latency issue as an example the recommended solution includes the parameters adjustment and use of dedicated links instead of AFTN and/or through joining the CRV service.

Review AFTN Routing Directory Changes

3.4.27 The meeting noted the proposed changes in the AFTN Routing Directory based on the changes proposed from Hong Kong China, Japan, Republic of Korea and India. Some consequential changes have been also made with consideration of new AMHS circuits between States having made and some circuit had been withdrawn. The meeting also noted some other changes highlighted in the Report of ACSICG/5 including the name change of the directory to AFTN/ATSMHS Routing Directory for the Asia and Pacific Regions.

3.4.28 Hong Kong China reminded that once CRV is fully implemented in the Region, further routing directory changes would be required as more and more direct connections via VPN would be possible and the relation between the routing directory and the directory service registered in AMC should be addressed. The meeting agreed to refer these concerns to CRV OG and ACSICG for further consideration in its future meetings, and adopted Conclusion **CNS SG/22/7 on the Revised AFTN/ATSMHS Routing Directory** formulated by the ACSICG/5 meeting.

Updates on the APAC AMC Information

3.4.29 The meeting noted the work being carried out by AEROTHAI regarding updates on APAC AMC information. States/Administrations were urged to make necessary updates to the AMC information with the forms attached to ACSICG/5/IP/7:

- *Appendix F* – Pro forma for modification of AMHS MD Identifier and/or Addressing Scheme (for major change); and
- AMC Information Form for updating AMHS implementation and other information.

3.4.30 With regards to AMHS User Capabilities information to prepare for IWXXM information exchange, AEROTHAI was tasked to contact AMC and request information on AMHS User Capabilities form. AEROTHAI will coordinate with regional Point of Contacts of MTA to provide information of AMHS User Capabilities for updates to AMC.

Strategy for Implementation of Communication Systems to support ANS

3.4.31 ACSICG/5 meeting proposed further changes to the Strategy for Implementation of Communication Systems to support Air Navigation Service in the Asia/Pacific Region based on the latest developments. The APANPIRG/29 noted the proposed changes and adopted the following Conclusion:

Conclusion APANPIRG/29/17: Revised Strategy for Implementation of Communication systems to support Air Navigation Service		
What: That, the revised Strategy for implementation of Communication systems to support Air Navigation Service provided in <u>Appendix A</u> to the Report on Agenda Item 3.4 be adopted.		Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: The Strategy for implementation of Communication systems for APAC Region was adopted by APANPIRG in 2017. The strategy requires updates based on the latest development.	Follow-up: ☒ Required from States	
When: 5-Sep-2018	Status: Adopted by PIRG	
Who: ☒ APANPIRG ☒ APAC States ☐ ICAO APAC RO ☐ ICAO HQ ☐ Other:		

Space-based VHF Voice Communication Service

3.4.32 The meeting discussed a proposal made by Singapore at ACSICG/5 meeting on a potential solution using VHF radios relay installed on satellites. It was stated that there are no space-based ADS-B like solutions for the case of VHF communication, as Direct Controller Pilot Communication (DCPC), to support radar-like separation minima in these areas.

3.4.33 Singapore has been working with satellite and communications vendors - Gomspace AS (Gomspace) and Singapore Technologies Engineering Electronics (STEE) to conduct design studies and trials/proof-of-concept for satellite-mounted VHF voice communication relay system ("space-based VHF") on Low Earth Orbit (LEO) satellites. Introduction on the ConOps included a constellation of 64 satellites operating at 600 km altitude in near-equatorial orbit. The design study was expected to be completed by the end of 2018 and followed by a proof-of-concept (POC) demonstration in the end of 2019. The POC would include the launching of a few satellites equipped with the VHF relay stations. Therefore, ICAO was requested to provide three frequencies for the POC. CAAS is working with the Singapore radio regulator, on ITU allocation of VHF frequencies for space-based VHF voice services purpose, to table for WRC-2023 agenda approval at WRC-2019. In this connection, States and ICAO were invited to support the ITU application process of allocating the aeronautical VHF frequency band for space-based VHF communication service during the POC trials planned from 2018 to 2023.

3.4.34 Considering the space-based VHF communication service is a first-of-its-kind, innovative solution for use in association with appropriate surveillance sensors such as space-based ADS-B, to provide radar-like separation minima in oceanic and domestic airspace, including the category R airspace as specified in the seamless ATM plan, the meeting endorsed the operation requirement for such communication service and supported the POC study. In view of the foregoing the meeting adopted the following Conclusion:

Conclusion APANPIRG/29/18: Support allocation of radio spectrum for space based VHF communications	
What: That, a) States and ICAO be invited to initiate and support the ITU application process of allocating an appropriate aeronautical VHF frequency band for space-based aeronautical mobile communication service for WRC-2023; b) States and ICAO be invited to take note of the potential benefits of space-based VHF aeronautical mobile communication service to enhance safety, capacity and efficiency of air navigation services by supporting the Proof-of-Concept tests; and c) ICAO is invited to assign three aeronautical VHF channels for the duration of the Proof-of-Concept tests.	Expected impact: ☐ Political / Global ☒ Inter-regional ☒ Economic ☒ Environmental ☒ Ops/Technical
Why: There is a need to support the POC study on space based VHF aeronautical mobile communication for Category R and other suitable airspaces in order to provide seamless VHF communication service to support radar like separation minima in those area.	Follow-up: ☒ Required from States and ICAO
When: 5-Sep-2018	Status: Adopted by PIRG
Who: ☒ CNS Sub-group ☒ APAC States ☒ ICAO APAC RO ☒ ICAO HQ ☐ Other:	

The Regional Preparatory Activities for WRC-2019

3.4.35 The meeting noted the regional preparatory activities for WRC2019 including the outcomes of Third meeting of APT Regional Preparatory Group meeting for ITU World Radiocommunication Conference (WRC-19) held in Perth, Australia in March 2018. Regarding WRC-19 Agenda Item 1.10, the ICAO studies had determined that the GADSS requirements can be satisfied using systems operating within existing frequency allocations. Hence no action to modify Article 5 of the Radio Regulations will be required. However, it appears likely that amendments will be required to Chapters VI, VII and VIII of the Radio Regulations to facilitate the introduction of GADSS. This development in particular on “no spectrum is necessary for GADSS” was provided to ITU-R WP5B on 26 October 2017 and also was expressed by the ICAO representative at APG19-3 WP5 and its draft group meetings held in March 2018 in Perth, Australia.

3.4.36 The outcomes of APG19-3 on APT preliminary views is generally in line with ICAO position. A comparison table containing the regional preliminary views of APT/APG against ICAO approved position is provided in *Appendix A* to CNS SG/22/WP/18 for easy reference. The APG19-4 meeting hosted by Republic of Korea is scheduled for 7-12 January 2019 in either Seoul or Busan. The APG19-5 meeting hosted by Japan is scheduled for 31 July 2019 to 6 August 2019. The focal points nominated by the Civil Aviation Administrations in the APAC Region were encouraged to participate in the APT APG meetings. The meeting reviewed and updated the focal points designated by States for WRC-2019 which is provided in *Appendix H* to CNS SG/22 meeting report.

World status of GBAS

3.4.37 Japan provided GBAS implementation status information obtained from the GBAS Working Group (GWG) met at Montreal, Canada from 17 to 20 April 2018 and 19th International GBAS Working Group held in Krakow, Poland from 15 to 18 May 2018. Japan introduced the different level of GBAS implementation of 10 States and Eurocontrol, and the development of airborne systems of aircraft manufacturers, Airbus and Boeing.

3.4.38 Nepal asked the meeting about the recommended period of GNSS signal monitoring before the GBAS implementation. Singapore proposed to use available ionospheric threat model or to adapt available algorithms from other States as there is no specific criteria for this. The Secretariat appreciated Japan for the consolidated information on global GBAS implementation status.

Outcomes of PBNICG/5 Meeting

3.4.39 The meeting reviewed the outcomes of the PBN Workshop for Pacific Islands States, the Quality Assurance Workshop for Instrument Flight Procedures and the Fifth Meeting of the Performance Based Navigation Implementation Coordination Group (PBNICG/5) held on 30 April 2018, 1 May 2018 and from 2 to 4 May 2018 respectively and necessary follow-up work to be conducted.

3.4.40 The meeting was informed of global PBN implementation status and activities conducted by ICAO Panels/Study Group and ICAO PBN Programme Office. Among them, the meeting noted that following the amendment of Annex 6, only RNP AR operations were required specific operational approval and the other PBN operations would follow regulator's approval process, such as the approval of Operations Manual where PBN operations were defined and the oversight to the operator's PBN operations.

3.4.41 The meeting reviewed the updated information on PBN-in-a-page. The updated PBN-in-a-page reflected the proposal of amendment of ICAO PANS-ATM (Doc 4444), which will be applicable in November 2018 as well as the changed criteria of it. It also included PBCS requirements applicable to separations based on RNP navigation specification and operational requirements of Aeronautical Information Management (AIM). Accordingly, the meeting adopted the following Conclusion:

Conclusion APANPIRG/29/19: PBN-IN-A-PAGE (Version 2.0)		
What: That, a) The PBN-in-a-page (Version 2.0) in Appendix B to the Report on Agenda Item 3.4 be adopted as a regional supporting material and be published on the ICAO Regional Office website. <i>Note – The contents of the PBN-in-a-page was extracted from ICAO documents including Doc 9613, Doc 8168 Vol. II, Doc 4444, and Annex 15. The PBN-in-a-page should be used as a quick reference during PBN airspace designing and PBN implementation planning.</i> b) ICAO Regional Office forward the PBN-in-a-page (Version 2) to the relevant Panels and Study Groups for their information and consideration.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☒ Environmental ☒ Ops/Technical
Why: The current version of PBN-in-a-page needs to be updated to reflect the amendments of the PANS-ATM and the implementation of PBCS. It also needs to be forwarded to the relevant ICAO bodies for their information and consideration.	Follow-up: ☒Required from States	
When: 5-Sep-2018	Status: Adopted by PIRG	
Who: ☒APANPIRG ☒APAC States ☐ICAO APAC RO ☒ICAO HQ ☒Other: ICAO APAC RSO		

3.4.42 The meeting was informed that PBNICG/5 discussed common PBN implementation challenges faced by States and recognized following challenges and interests to be considered by the regulator and ICAO when planning PBN implementation assistance:

- Lack of involvement of top management regarding PBN;
- Lack of flight validation pilots and training;
- Operation of PBN incapable aircraft;
- Regulator's capability for the PBN operational approval;
- Challenge with the military;
- Challenging terrain environment;
- Need for more PBN training for Air Traffic Controllers to make them more confident in PBN, like mixed mode operations between PBN and non-PBN approved aircraft;
- Interest in the anticipated implementation of SBAS/GBAS by sharing experience in a workshop;
- Advanced training of Procedure Designers; and
- Training of safety oversight.

3.4.43 The meeting reviewed the proposed draft of ***Catalogue of Asia and Pacific Flight Inspection and Flight Validation Service Providers*** which was the result of the survey on Asia/Pacific flight validation and flight inspection providers' capability. Accordingly, the meeting adopted **Conclusion CNS SG/22/11 on the Catalogue of Asia/Pacific Flight Inspection and Flight Validation Service Providers**.

3.4.44 The meeting was informed of the outcomes of the PBN Workshop for Pacific Islands States and the Quality Assessment Workshop for Instrument Flight Procedures. The PBN workshop identified areas that need to be improved for the PBN implementation of Pacific Islands States, such as PBN implementation plan development, trainings for procedure design, PBN operational approval and air traffic controllers, etc. and asked to review the possibility of PBN Go Team support for Pacific Islands States. The quality assessment workshop recognized that some States had been experiencing difficulties in conducting their quality assurance activities and safety oversight because of the lack of resources and considering delegating some of their functions to the third party.

3.4.45 Regarding the PBN implementation status in the region, the meeting was informed that the implementation information on ICAO Regional Dashboard based on third party data and the Air Navigation Implementation Status based on APAC Seamless ATM monitoring (<https://portal.icao.int/space/Pages/ANPage.aspx>) was different each other. The former showed 63% implementation while the latter showed on 46% implementation. The meeting was also informed that no new PBN implementation plan was received but two States submitted their updated PBN plan and six States would update their PBN plan.

3.4.46 The meeting was informed that the PBNICG/5 discussed on real-time GNSS status monitoring on the ground. Considering no direct relationship between the failure or the removal of a core satellite of GNSS or an SBAS reference Station and aircraft performance, different algorithms used for avionics designs, and various available ranging sources and sensors, provision of real-time

GNSS status monitoring is impractical for GNSS ABAS operations and RAIM prediction for RNP APCH will be sufficient for users and ATC services. However, regarding the use of GBAS and SBAS, ground based real time monitoring information may be provided based on a valid operational requirement.

3.4.47 Australia mentioned that States should be aware when implementing PBN using GNSS as the enabling technology that GNSS/RAIM unavailability is dependent on the application. For example, an aircraft conducting operations based on RNP APCH (0.3NM) may experience an outage, whereas an aircraft in the same geographic area conducting operations using RNP2 will not. In this reason, PBN training for pilot and air traffic controllers should include these differences in the training material so that pilots and air traffic controllers could be aware of the different applications of PBN and disseminate GNSS status information selectively.

3.4.48 The draft Conclusion was also noted by the ATM SG/6 meeting which considered insufficient basis to support this draft Conclusion. *The CNS SG considered that PBN training for pilot and air traffic controllers should include these differences in the training material so that pilots and air traffic controllers could be aware of the different applications of PBN and disseminate GNSS status information selectively.* In view of the foregoing, the meeting adopted the following Conclusion:

Conclusion APANPIRG/29/20: Ground Based GNSS Status Monitoring	
What: Recognizing that the availability of GNSS is crucial for GNSS based PBN procedures, that the performance of GNSS on the ground may be different from that in the aircraft, and that the States should determine essential radio navigation services for GNSS based approach, landing or take-off, which require timely warnings on the GNSS status to ATC services, That, States be urged to: a) define the essential radio navigation services for GNSS based operations; b) be aware that requirement for air traffic controllers to provide real time GNSS status monitoring to aircraft for GNSS ABAS procedures may not be required; c) ensure that GNSS/RAIM unavailability prediction be provided to users; d) ensure that pilot reports as far as practical on GNSS status should be provided to ATC for dissemination to other aircraft as real time GNSS information; and e) reflect their operational procedures within AIC and/or AIP.	Expected impact: ☒ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: As GNSS on board performance might be different from GNSS performance observed on the ground, pilot might be confused if there is any difference between the two environments. Therefore, ground based GNSS status monitoring information used for ABAS should be used as advice to ATS.	Follow-up: ☒ Required from States
When: 5-Sep-2018	Status: Adopted by PIRG
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☒ Other: ICAO APAC RSO	

3.4.49 The meeting reviewed ICAO's new plan on the transition of RNP APCH chart identification from RNAV to RNP that was issued in Electronic Bulletin (EB2018/11) and Circular 353. The meeting noted the roles of ICAO PBN Programme Office in ICAO Headquarters, Regional Office and States, the coordination process among the related stakeholders as shown in Figure 1 of Attachment A of WP/12. The meeting also noted the result of a survey on the published RNP APCH procedures of both international and domestic airports collected from ICAO iSTAR application, JeppView software and States. The result indicated that 916 airports of 39 Member States, Administrations and territories have 1,786 GNSS-based approach procedures in the APAC Region as shown in Figure 2 of Attachment A of WP/12.

3.4.50 The meeting was informed that the PBNICG/5 discussed various topics related to the RNP APCH chart identification transition from RNAV to RNP including the development of regional transition plan, division of geographical area, grouping State cluster, coordination process, timeline of the regional plan development, and procedure publication planned. CNS SG/22 endorsed draft Conclusion CNS SG/22/13 formulated by PBNICG and forwarded to ATM SG/6 for further endorsement.

ISTF technical paper publication

3.4.51 Japan provided information on the publication of a technical paper presenting the APAC GBAS ionospheric threat model developed by Ionospheric Studies Task Force (ISTF), which was dissolved in 2016. The technical paper was published in the technical journal, GPS Solutions under the title of "Ionospheric delay gradient model for GBAS in the Asia-Pacific region" and is available at the journal's website: <https://link.springer.com/article/10.1007/s10291-017-0662-1> as an Open Access article.

Third Meeting of the Surveillance Implementation Coordination Group

3.4.52 The meeting reviewed the outcomes of the Third Meeting of the Surveillance Implementation Coordination Group (SURICG/3) was held in Denarau, Fiji from 25 to 27 April 2018.

Revise ADS-B Version 2 ADS-B Out Forward Fit Equipage

3.4.53 The meeting noted the necessity to amend the APANPIRG Conclusion 26/44 which was adopted in 2015 through APANPIRG/26/44 regarding forward fitment mandate for ADS-B avionics compliant with Version 2 ES (equivalent to RTCA DO260B) from 8 June 2018.

3.4.54 The above Conclusion encouraged States to adopt forward fitment mandate effective two years after the European forward fitment effective date was considered reasonable and achievable. On 6 March 2017, the European Commission issued Implementing Regulation 2017/386, which included an amendment to remove the ADS-B "forward fitment" requirement and rely solely on the 7 June 2020 mandate date for Version 2 ADS-B fitment. With such change, the forward fitment mandate date recommended in the APANPIRG conclusion will be two years earlier than the European ADS-B mandate. Hence, there is a need to review and amend APANPIRG Conclusion.

3.4.55 The meeting agreed to shift the forward-fit mandate date to align with the U.S. and European fitment date. The meeting also noted that ATM SG had also endorsed the proposal. Hence, the meeting adopted the following Conclusion:

Conclusion APANPIRG/29/21: Revised ADS-B Version 2 ADS-B Out Forward Fit Equipage		
What: Review APANPIRG Conclusion 26/44 regarding fitment of Version 2 ES ADS-B, to revise the applicable date as per the below: 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 2020 be equipped with ADS-B avionics compliant with Version 2 ES (equivalent to RTCA DO-260B) or later version.		Expected impact: ☐ Political / Global ☒ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: Alignment with United States and the revised European dates. This Conclusion supersedes APANPIRG Conclusion 26/44.	Follow-up: ☐ Required from States	
When: 5-Sep-2018	Status: Adopted by PIRG	
Who: ☒ APANPIRG ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:		

Baseline ADS-B Service Performance Parameters

3.4.56 A proposal was raised to amend Baseline ADS-B Service Performance Parameters adopted by APANPIRG/18 in 2007. It was proposed to change the maximum Aircraft Update interval from 5 seconds to 12 seconds for Category 1 (Tier 1) 5NM separation, to align with lower update rate radar services currently in service and ICAO Circular 326. The meeting discussed the proposal and considered that in most cases the minimum update is based on the concept of the performance based surveillance. The meeting then agreed to the revised Baseline ADS-B Service Performance Parameters presented by PNG, New Zealand and Australia. The meeting further agreed to incorporate the revised Baseline ADS-B Service Performance Parameters into the AIGD as *Appendix 6*.

Safeguard ATC operations from problematic ADS-B avionics

3.4.57 Hong Kong, China presented their implementation of the mechanism and procedures with an exclusion list in safeguarding ATC operations from problematic ADS-B within Hong Kong FIR. Aircraft consistently transmitting erroneous ADS-B data would be considered for entering into the exclusion list, the flight plan of the concerned aircraft would be pre-processed to alert the air traffic controllers in the electronic flight strips. Coordination with adjacent Area Control Centre (ACC) would be needed to alert upstream ACC that the concerned aircraft would be denied from access to the exclusive ADS-B airspace within HKFIR.

3.4.58 The aircraft will be removed from the exclusion list once notification from the aircraft operators/regulatory authorities is received that the problem has been rectified, and performance monitoring shows the observed problem has been resolved. The Meeting encouraged States/Administrations using ADS-B for operation to implement similar provisions with reference to the AIGD and endorsed the proposal to include Hong Kong China's experience into the AIGD.

Amendment to Guidance Material on Generation, Processing & Sharing of ASTERIX Category 21 ADS-B Messages

3.4.59 The CNS SG/22 meeting endorsed the recommended amendments to the "Guidance Material on Generation, Processing & Sharing of ASTERIX Category 21 ADS-B Message" which was adopted by APANPIRG/23 in 2012 through conclusion 23/31 and available at the following

website:

<https://www.icao.int/APAC/Documents/edocs/cns/Guidance%20Material%20on%20ASTERIX.pdf>

3.4.60 The meeting agreed to the proposed amendments to align with the development in 2018. Accordingly, the changes presented to the meeting are also agreed to incorporate into the amended Guidance Material on Generation, Processing & Sharing of ASTERIX Category 21 ADS-B Messages into the AIGD as *Appendix 7*.

ADS-B Implementation and Operations Guidance Document (AIGD)

3.4.61 The meeting further reviewed and agreed to the multiple amendments proposed to the AIGD using the Request for Change Form. The meeting agreed to consolidate other changes to the AIGD proposed at SURICG/3 meeting in addition to those amendments highlighted above and adopted **Conclusion CNS SG/22/15 for Revised ADS-B Implementation and Operations Guidance Document (AIGD)**.

ATC Automation Requirements and Space based ADS-B

3.4.62 Most ATC systems that support terrestrial ADS-B will also support space based ADS-B without modification. The meeting noted relevant detailed issues with both ADS-B ground stations and space based ADS-B. There were 3 strategies to be recommended for consideration together with the APANPIRG ADS-B Guidance Document. The strategies that may be used to allow an ATC automation system to accept either terrestrial or space based ADS-B:

- a) Contracting an ATM supplier to upgrade or replace the ATC system;
- b) Performing the adaptation “in house” or by contracting 3rd parties to do so alternatives:
 - Making ADS-B “look like” an existing sensor input;
 - Changing the ATM system software/hardware to process ADS-B (more desirable)
- c) Consultants, ADS-B ground station providers and Space based ADS-B service providers are likely to be willing to provide support.

The SEA/BOB ADS-B WG/13 Report

3.4.63 The meeting noted that the Report of the Thirteenth Meeting of the South-East Asia/Bay of Bengal Sub-Regional ADS-B Implementation Working Group (SEA/BOB ADS-B WG/13, 14-16 November 2017 in Colombo, Sri Lanka) was reviewed by SURICG/3 and outcomes was consolidated in the meeting report of SURICG/3.

The DAPs WG/1 Meeting Report

3.4.64 The meeting also noted that the Report of the First Meeting of DAPs Working Group (Mode S DAPs WG/1, held in March, 2018) was reviewed by SURICG/3, and SURICG/3 adopted the revised ToR of Mode S DAPs Working Group through Decision SURICG/3/3. The revised ToR provided in *Appendix F* to the SURICG/3 meeting report includes wider scope of the related study and need to conduct Mode S DAPs performance evaluation.

Mode S DAPs Implementation and Operation Guidance Document (DAPs IGD)

3.4.65 The initial structure of DAPs IGD was developed by DAPs working group based on the framework of the well-developed ADS-B Implementation and Operation Guidance Document (AIGD), with adaptation to suit the contents of Mode S DAPs implementation. The meeting noted the structure of the Mode S DAPs IGD endorsed by SURICG/3 meeting.

Appendices including implementation checklist

3.4.66 The CNS SG further noted that a working team comprising China, Hong Kong China, Japan, Malaysia, Singapore and Thailand will work offline to populate the various section of the DAPs IGD. In addition, New Zealand will provide support on ad-hoc basis. The meeting also noted the breakdown of tasks to be completed were assigned to members of the drafting group for the IGD with target date for completion by 30 July 2018.

3.4.67 In the light of the latest development on ATM systems and surveillance systems in States/Administrations, the meeting strongly encouraged members to attend the SURICG, and relevant SEA/BOB ADS-B WG, and Mode S DAPs WG.

Regional SSR Mode S Interrogator Identifier Codes

3.4.68 The CNS SG/22 meeting noted the status of Mode S Interrogator Identifier (II) codes coordinated by and registered with the ICAO APAC Regional Office. States/Administrations were urged to review the Third Edition of the SSR Mode S II codes list (published in May 2017) provided in the ICAO portal site (RO_APAC group) under CNSDOCS, and coordinate with the ICAO Regional Office for registration of II codes before use, particularly at radar sites located close to the airspace of adjacent States.

3.4.69 The meeting noted that the ICAO APAC office has a plan to issue new Edition of SSR Mode S II code list by the end of 2018. States/Administrations were then urged to provide the required information to ICAO Regional Office for coordination and updating the list by the end of 2018.

Mode S Conspicuity Code- PfA to ANP - Asia and Pacific Regions, Vol. II

3.4.70 The meeting noted that SURICG/3 meeting adopted a proposal to use Mode A Code A1000 as the regional Mode S conspicuity code for the future requirements. The meeting noted that the amendment proposal to the ANP – Asia and Pacific Regions, Vol. II was relevant to Part IV – Air Traffic Management (ATM) section. Therefore, the meeting reviewed and endorsed a Working Paper prepared by Australia and Co-chairs of SURICG for consideration by the ATM SG/6 meeting. Japan and Thailand expressed their agreement to the proposed PfA to RANP. SURICG co-chair from Hong Kong China was requested to present the Working Paper as shown in IP/2 in CNS SG/22 to ATM SG. The SURICG co-chair from Hong Kong presented the Working Paper in the ATM SG/6 meeting and ATM SG endorsed a Conclusion to adopt Mode A Code A1000 as the regional Mode S conspicuity code.

Review of ADS-B Specific Phraseologies

3.4.71 At CNS SG/22 meeting, New Zealand proposed a review of DOC 4444, Chap 12, 12.4.3 ADS-B Phraseologies. The current ADS-B Phraseologies in the PANS-ATM can, and do generate confusion to both pilots and ATC and unnecessary RTF. It was therefore proposed, where the functionality for MODE S and ADS-B is derived from the same source, the phraseologies used must be the same for both, i.e. using SSR phraseologies to avoid confusion. IATA and Kiribati strongly support the proposal to remove confused phraseologies or adding explanatory notes to

PANS-ATM. Accordingly, the CNS SG endorsed draft Conclusion CNS SG/22/16 for further consideration by ATM SG/6 meeting.

ADS-B Implementation Status

3.4.72 The meeting noted ADS-B mandate in the NZZC FIR in two phases:

- Phase one: NZZC FIR - all controlled airspace above FL245 commencing midnight Dec 31 2018;
- Phase two: NZZC FIR – Proposed ADS-B mandate for all controlled airspace commencing midnight 31 Dec. 2021;
- The ADS-B Rules and Mandate for use of ADS-B FL245 and above are published in “Advisory Circular” AC91-24 (24th July 2018) and “Notice of Requirement” NTC-91.258 (20 July 2018) and relate to Civil Aviation Rule Parts 21, 43 and 93, and specifically to:
 - Rule Part 91, Amendment 30, rules 91-253 to 91-258A Automatic Dependent Surveillance-Broadcast Systems,
 - NZ's mandate has been included as “AC91-24 Rev 0” which has been issued on 24 Jul 2018:
https://www.caa.govt.nz/assets/legacy/Advisory_Circulars/AC91-24.pdf
 - "NTC 91.258":- is available at
<https://www.caa.govt.nz/assets/legacy/rules/notices/Notice-NTC-091-258.pdf>
- Further info can be obtained at adsb@caa.govt.nz

3.4.73 The meeting participants were requested to provide the information to those airlines/operators who fly or intend to fly into New Zealand.

3.4.74 The meeting noted the ADS-B Implementations Status in the APAC Region provided in Appendix L to CNS SG/22 meeting report.

Competency-based Training and Assessment Programme

3.4.75 Further to the initial introduction to the main principles of their competency-based training at CNS SG/21 meeting, the Philippines made a presentation with detailed information on their competency-based training and assessment program being implemented by CAA Philippines to enhance the competence of ATSEPs and ensure high operational safety standards in the management, operation, and maintenance of CNS/ATM systems.

3.4.76 CAA Philippines (CAAP) recognizes the importance of the work of ATSEP in ensuring high operational safety standards in civil aviation. This opt the management to include ATSEPs in the group of aviation professionals including pilots, aircraft mechanics, and air traffic controllers, etc., to undergo training and assessment before allowing to perform an aviation related activity without direct supervision. In January 2017, the *Philippine Civil Aviation Regulation (PCAR)* was amended to include the rules and regulations for the licensing and rating certification of ATSEPs. The PCAR enumerates among others, the requirements with regards to training and assessment that an applicant must comply before the issuance of License and Rating.

3.4.77 The Civil Aviation Training Center (CATC-Manila) is providing the classroom training requirements for ATSEPs since 1978, whilst on-the-job training has been informally conducted by the ANSP. However, with the publication of Doc. 7192 - Training Manual for ATSEP, Doc. 10057 - Manual on ATSEP Competency-based Training and Assessment, and Doc. 9868 - Procedures for Air Navigation Services – Training, CAAP gradually adopted the above-mentioned guidance materials and formalized the training and assessment of ATSEPs.

3.4.78 The steps in ATSEP Training and Assessment Progression were introduced in the presentation. A number of clarifications were also made to the questions asked such as period for initial training required, emergency and conversion training and licensing. The CNS SG meeting recognized the benefits of Competency-based Training for ATSEP and considered also important for States/Administrations to implement the established training programme and progression. CNS SG would further promote to share information on the national training frameworks at its next meeting. Fiji, Japan and Republic of Korea agreed to share their experiences gained at CNS SG/23 meeting.

Outcomes of Asia/Pacific Regional Cybersecurity Symposium

3.4.79 The meeting noted the outcomes of the ICAO Asia Pacific Regional Cybersecurity Symposium (APAC RCS) held at the Civil Aviation Department Headquarters, Hong Kong China, from 15 to 16 May 2018. The symposium was co-hosted by the Civil Aviation Department of Hong Kong (HKCAD) and the Airport Authority Hong Kong (AAHK). The theme of the Symposium was “Cybersecurity in Air Navigation and Airport Services”. The Symposium was attended by 169 participants from 14 States/Administrations, 4 International Organizations (ACI, EASA, CANSO and IATA) and a number of technology/solution providers. A total of 26 presentations were made by various experts under six sessions in the Symposium, covering a wide spectrum of cybersecurity areas in air navigation and airport services. The Symposium has concluded the need to address cybersecurity threats and issues in the Region. The report including the summary of presentations and the questions raised and discussed during the Symposium is available at: <https://www.icao.int/APAC/Meetings/Pages/2018-Cyber-Security.aspx>. As this topic is aviation security related, the ICAO advised that the papers and presentation materials would be available to States/Administrations upon request.

3.4.80 There was a proposal again to establish a regional working group under the CNS Sub-group of APANPIRG to deal with the cyber security related issues. Considering the activities being conducted by ICAO HQ through SSGC at global level and three working groups (Airworthiness WG, Aerodromes WG and Current and Future ANS WG) being established. The meeting considered better to wait for the further guidance to be developed at global level to avoid duplicated efforts. The meeting was informed that the first combined meeting of the SSGC Working Groups will be held on 14 August 2018 through a virtual meeting. The States/Administrations in APAC Region are encouraged to monitor the progress and contribute to the efforts of the SSGC by nominating and sending subject matter experts to participate in these Working Groups, as per ICAO State letter 2018/63, to work towards the development of a comprehensive and unified strategy for cybersecurity that can reflect the global and regional environments. In this regard, the meeting deliberated and agreed to keep in view of the forthcoming development to avoid duplicating efforts and to review the situation in the next CNS Sub-group meeting.

Need for Guidance on Performing Safety Assessment of CNS equipment

3.4.81 Nepal stated that according to the ICAO PANS-ATM (Doc4444), Chapter 2 which requires safety review of ATS units to include, inter alia, aspects pertaining to operational and technical issues to ensure that communications, navigation, surveillance and other safety significant systems and equipment meet the required level of reliability and availability as defined by the

appropriate authority. Nepal also seeks to learn from the experience of other APAC ICAO Member States on how to determine the “required” levels of reliability and availability for CNS systems and associated training requirements.

3.4.82 The CNS SG/22 meeting discussed the issues identified by Nepal. A number of States including Australia, India, Bhutan and Singapore also shared their views with the meeting. The meeting was of the view that the global guidance would be made available at high level and general perspective, and may not fully suit individual and specific needs. The requirement stated in the PANS-ATM may be purposely made generic since the appropriate authority, which knows the operating and construction environments, is in the best position to set the required level of reliability and availability rather than to comply with some quantitative figures set by someone else.

Acquisition Excellence for ANSPs (WP20)

3.4.83 Through the paper, CANSO highlighted the CANSO Acquisition Excellence Manual published in 2018 to share and promote best practices in acquisition management for ANSPs. As air traffic continues to rise in the Asia Pacific Region, ANSPs need to ensure that air traffic capacity can keep pace with demand by investing in ATM systems and other related infrastructure. Acquisition excellence is therefore vital for ANSPs that want to achieve the most from its procurement budget and supply chain relationships. In order to maximize purchasing power in the ever-changing ATM environment, a tailored, focused and flexible approach to acquisition is essential. The CANSO Acquisition Excellence Manual can be downloaded at the website www.canso.org.

3.4.84 The Manual shares and promotes the best practices for acquisition management throughout the supply chain. It serves as an essential guide for system acquisition with a series of case studies and would help ANSPs prepare for purchasing models by providing insight and guidance on acquisition best practice from both sides of the table. The meeting appreciated the information provided by CANSO. States and ANSPs were encouraged to avail themselves of the CANSO Acquisition Excellence Manual. The manual would be a good reference document for regional guidance on procurement & certification of CNS/ATM and associated services & systems being developed by the CNS SG since there are various case studies involving acquisition strategy.

Need for ATS Surveillance & DCPC VHF Coverage Charts (WP/21)

3.4.85 Hong Kong China and Thailand jointly collaborated the paper and highlighted the need to enhance the surveillance and Direct Controller and Pilot Communication (DCPC) VHF coverage where gaps exist in APAC Region along some of the busy air traffic routes at boundaries between FIRs. In addressing such need, Hong Kong China and Thailand proposed to establish a mechanism to produce charts and regularly update them in a sustainable manner to show the latest situation in ATS surveillance and DCPC VHF coverage in the Asia Pacific Seamless ATM Plan for the region, overlaid with busy air traffic routes, so that resources in enhancing the surveillance and DCPC VHF coverage with a view to addressing the gaps can be prioritized and optimized in a holistic, collaborative and harmonized manner.

3.4.86 The paper reviewed efforts having and being made with an attempt to produce coverage charts in ATS surveillance and DCPC coverage for the region/sub-region. However, the efforts were scattered across different bodies while some past efforts have been discontinued. Riding on previous efforts and experience gained, Hong Kong China and Thailand proposed a systematic mechanism to be established with a view to producing the first version of the charts and updating them in a sustainable manner to show the latest situation in ATS surveillance and DCPC VHF for the region. The meeting expressed appreciation to the initiatives from Hong Kong China and Thailand to

address the need of the region. The meeting also reviewed and agreed to the mechanism, steps and timelines for implementation as outlined in the table below:

Step	Description	Target Date
1	Conduct survey	(a) ICAO Regional Office to issue State Letter for a regular survey to APAC States/Administrations with an aim of collecting information related to the current and planned ATS surveillance and DCPC VHF coverage by <u>December 2018</u> . (b) States/Administrations to provide response to the survey to designated POC of Hong Kong China and Thailand by <u>end February 2019</u> .
2	Produce coverage charts	(a) Hong Kong China and Thailand volunteered to produce the first version of ATS surveillance and DCPC VHF coverage charts by <u>end April 2019</u> . (b) The initial charts are reviewed and endorsed by the CNS Sub-group and its contributory bodies by <u>end July 2019</u> .
3	Publish first version of the charts and regular review/update	(a) APANPIRG/30 to consider for incorporation of the surveillance and DCPC VHF coverage in Asia Pacific Seamless ATM Plan in <u>September 2019</u> . (b) CNS Sub-group and its contributory bodies will regularly review and update to the coverage charts in its future meetings.

3.4.87 The meeting further discussed the purpose of the survey: i.e. to provide data for analysis in order to identify the gaps of coverage for remedial solutions in association with seamless ATM plan. While the provided data would be kept confidential, those sensitive data related to the facilities (e.g. their location) might be de-identified as appropriate. Some States raised the request to consider expanding scope of the task to include surveillance and communication means relying on datalink. The ICAO Secretariat explained the task is on-going and the main focus for the first version is on ATS surveillance and DCPC VHF communication. After discussion, the request for datalink will be considered in the on-going work and details will be discussed among ICAO Regional Office, concerned states, and CNS Sub-group and its contributory bodies. The intention to use space-based ADS-B by some Administrations/ANSPs may also be included into the survey as appropriate. In view of the foregoing, the meeting encouraged States/Administrations to contribute relevant information and work with ICAO Regional Office, Hong Kong China and Thailand in designing the survey and subsequently producing the coverage charts. Hong Kong, China and Thailand agreed to prepare the updated charts based on survey results. Accordingly, the meeting adopted the following Conclusion:

Conclusion APANPIRG/29/22: Survey on Surveillance and DCPC VHF Coverage		
What: That, States/Administrations be urged to respond to regular survey on Surveillance and Direct Control and Pilot Communication (DCPC) VHF Coverage to be circulated through an ICAO State Letter and advise the Point of Contact.		Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: To analyse the gaps of surveillance and DCPC VHF coverage for remedial action plans to be taken by States/Administrations to provide seamless ATM service in APAC Region	Follow-up: ☒ Required from States	
When: 5-Sep-2018	Status: Adopted by PIRG	
Who: ☒ APANPIRG ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:		

Successful Implementation of CRV link between Hong Kong and Manila (WP/22)

3.4.88 Hong Kong China informed the meeting of the successful implementation of voice communication since 14 August 2018 over the Common aeronautical Virtual Private Network (CRV) between the Area Control Centers (ACCs) of Hong Kong and Manila which is the first city-pair using CRV for operation in the APAC Region. The Hong Kong CAD and Civil Aviation Authority of the Philippines (CAAP) engaged into individual contracts with the CRV Service Provider, PCCW Global, on 6 April and 22 March 2018 respectively. The installation of CRV connections at the respective sites were completed and accepted by both ANSPs in the end of June 2018.

3.4.89 Hong Kong China highlighted that the CRV data link is used for voice communication in the first phase and will be used for data exchange over AMHS in the second phase, which is targeted for 2019 with mutual agreement between Hong Kong China and counterparts. With more States/Administrations implementing CRV, it is anticipated that more benefits could be reaped including the support for various new initiatives and technologies under the ICAO GANP/ASBU Block 1 commencing 2019, which rely on a secured and reliable data network as an enabler.

3.4.90 APANPIRG member States therefore were encouraged to expedite CRV implementation to achieve early benefits. States/Administrations were also invited to consider adoption of phased approach for CRV implementation, with the easier implementation, such as voice communication, that is of lower complexity to be proceeded first.

Global Harmonization of the Datacom Implementation for Realization of TBO (WP/30)

3.4.91 Over the last two decades, existence of fragmented DATACOM context is obviously due to a lack of global technological harmonization. It is consequently bringing fragmented communication infrastructure with complex on board avionics equipage. As already known, ICT/IPS would make a fundamental shift in communication technology, breaking away from old-fashioned aviation data-link technology brings a significant revolution for TBO infrastructure in ATM community.

3.4.92 As a remarkable topic for standardization, ICAO and SMOs agreed for joint activity of standardization/specification. States are urged to recognize that GANP/ASBU will face difficulties with the implementation in relation to the stakeholders if the standardization of IPS DATACOM

could not have achieved, and States were encouraged to support ICAO to develop a standardized roadmap for IPS DATACOM. The Secretariat was requested to bring these requests (WP/30 & WP/31) for attention by the relevant panels.

The Necessity of Harmonization for Implementation of New Operations (WP/31)

3.4.93 Japan shared the meeting with its experience on the need for appropriate support, evaluation, and an implementation strategy for System-Wide Information Management (SWIM), Flight and Flow-Information for a Collaborative Environment (FF-ICE), and Trajectory-Based Operations (TBO).

3.4.94 There is a gap of information being exchanged between operators and ATM existed in continental boundaries, between FIRs and Regions, these information exchange limitations make all stakeholders lose the best use of capacity and capability. When one can share valuable data between stakeholders in a timely manner, capacity and capability can be utilized in more efficient ways with the consideration of the emerging issues related to cyber security.

3.4.95 Technology is the enabler to achieve an operational improvement, however the environments of information quality, airspace capacity and flexibility, might restrict the benefits from being realized. For assuring the intended benefit from technology, all stakeholders should evaluate and improve the operational environment to maximize the benefit through a regional and cross regional approach. States are urged to engage industry stakeholders in establishing clear objectives for quantitative and qualitative benefits on deployment processes of SWIM and FF-ICE toward the TBO. ICAO is requested to ensure there is an appropriate level of support for the new Standards and technological implementations, so that they can be applied in an efficient and Cost-Beneficial manner.

Information paper submitted under Agenda Item 3.4

3.4.96 Under this agenda item, the meeting also noted the following information papers received from States and International Organizations:

- IP/09 Australia provided the summary of its recent activities in the Aviation domain associated with implementation of a Space Based Augmentation System (SBAS) capability that should be pursued as an item of National Infrastructure.
 - IP/10 Aireon updated the extensive commissioning activities for its Space-Based Automatic Dependent–Broadcast (ADS-B) service. The system will commence operational trials in late 2018.
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Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.5. MET

Meteorology Sub-Group Report (WP/13)

History of the meeting

3.5.1 The ICAO APAC Office, Bangkok, Thailand, hosted the Twenty-Second Meeting of the Meteorology Sub-group (MET SG/22) from 18 to 21 June 2018. Fifty-eight experts attended MET SG/22 from Australia, Cambodia, China, Hong Kong-China, Macao-China, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, New Zealand, Philippines, Republic of Korea, Singapore, Thailand, United States, Viet Nam, IFALPA and the ICAO.

3.5.2 MET SG/22 discussed or considered in total nineteen working papers, twenty four information papers, one slide presentation and four discussion papers (in the plenary session). As an outcome from the discussions, MET SG/22 formulated one Draft Conclusion and three Draft Decisions requiring the attention of APANPIRG. In addition, MET SG/22 adopted four Conclusions and four Decisions of a technical nature requiring the attention of MET SG, States or ICAO.

Main outcomes from the working groups of MET SG

3.5.3 APANPIRG/29 noted the following main outcomes from the working groups of MET SG:

3.5.3.1. MET/IE WG/16 considered how to promote participation (in the technical forum) by the user groups (e.g., IATA, IFALPA and IFATCA) and the Pacific Islands Aviation Weather Services (PIAWS) Panel. MET/IE WG/16 also reported progress on the review of and proposed update to the *ROBEX Handbook*.

3.5.3.2. MET/S WG initiated an investigation of the implications for MET service providers of the different formats for transmission of special air-reports described in ICAO publications, including a proposal for ICAO to review the format for special air-reports in the ICAO documentation, i.e., Annex 3, Doc 8896 and Doc 4444.

3.5.3.3. MET/R WG/7 elected a new Chairperson, Mr. Ashwin Naidu (from the Australian Bureau of Meteorology), and Vice-Chairperson, Ms. Naoko Komatsu (from the Japan Meteorological Agency). MET/R WG/7 also reported progress on the development of regional guidance materials including the *ASIA/PACIFIC Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations* and the *Draft Guidelines for Operational SIGMET Coordination*.

Amendment 78 to ICAO Annex 3

3.5.4 APANPIRG/29 noted that MET SG/22 had reviewed Amendment 78 to ICAO Annex 3 adopted by the Council of ICAO. Amendment 78 will introduce inter alia modifications of IWXXM representations of information and new Standards and Recommended Practices (SARPs) for a space-weather information service. ICAO will support the space weather SARPs with the *Manual on Space Weather Information in Support of International Air Navigation* (Doc 10100), which ICAO plans to make available to States in time for applicability of the SARPs in November 2018.

Asia/Pacific Air Navigation Plan (ANP)

3.5.5 APANPIRG/29 noted that MET SG/22 had reviewed recent and proposed amendments to the APAC ANP, including further development by ICAO of a comprehensive amendment proposal to fill the missing data in the APAC ANP, Tables MET, which would align the ANP with the current, agreed regional requirements.

APANPIRG air navigation deficiencies in the MET field

3.5.6 Cambodia and Lao PDR reported to MET SG/22 the rectification of deficiencies in their respective areas of responsibility, i.e., deficiency Index No. AP-MET-09 and AP-MET-11 in Cambodia and AP-MET-12 in Lao PDR.

3.5.7 With respect to rectification of the deficiency Index No. AP-MET-09 in Cambodia, concerning the provision of meteorological information for operators and flight-crew members, including forecasts provided by the WAFCs, MET SG/22 considered that the implementation in Cambodia of Secure Aviation Data Information System (SADIS) reception facilities, and associated training of relevant meteorological personnel, validates the removal of the deficiency from the open list.

3.5.8 With respect to rectification of the deficiency Index No. AP-MET-11 in Cambodia, concerning the provision of Meteorological Watch Office (MWO) and SIGMET service for Phnom Penh FIR, MET SG/22 considered that Cambodia's current arrangement for the provision of SIGMET service on its behalf by China, since 2010, validates the removal of the deficiency from the open list.

3.5.9 With respect to rectification of the deficiency Index No. AP-MET-12 in Lao PDR, concerning the provision of SIGMET information for Lao PDR's area of responsibility, Japan informed MET SG/22 that Lao PDR had provided SIGMET information for Vientiane FIR during international SIGMET coordination activities. Furthermore, MET SG/22 reviewed results of SIGMET monitoring reported by Hong Kong, China and RODB Bangkok, which also supported the removal of the deficiency from the open list.

3.5.10 In view of the above, APANPIRG/29 adopted the following two Decisions:

Decision APANPIRG/29/23: Removal of deficiencies Index No. AP-MET-09 and AP-MET-11 from the APANPIRG (open) list	
What: That, APANPIRG removes the deficiencies Index No. AP-MET-09 and AP-MET-11 from the APANPIRG (open) list.	Expected impact: ☐ Political / Global ☐ Economic ☐ Environmental ☐ Inter -Regional ☒ Ops/Technical
Why: MET SG/22 considered that the corrective actions implemented by Cambodia, including the implementation of SADIS reception facilities and associated training of relevant meteorological personnel, and the provision of SIGMET service by China on behalf of Cambodia, since 2010, validates rectification of the deficiencies.	
When: On approval by APANPIRG	Status: Adopted by APANPIRG
Who: ☐ Sub Groups ☐ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

Decision APANPIRG/29/24: Removal of deficiency Index No. AP-MET-12 from the APANPIRG (open) list		
What: That, APANPIRG removes the deficiency Index No. AP-MET-12 from the APANPIRG (open) list.		Expected impact: ☐ Political / Global ☐ Economic ☐ Environmental ☐ Inter -Regional ☒ Ops/Technical
Why: MET SG/22 considered that the corrective action implemented by Lao PDR, including the establishment of agreements by relevant authorities, implementation of procedures for SIGMET issuance, training of personnel for SIGMET preparation, participation in ICAO APAC SIGMET tests and exercises and the issuance of SIGMET information in accordance with Annex 3, validates rectification of the deficiencies.		
When:	On approval by APANPIRG	Status: Adopted by APANPIRG
Who:	☐ Sub Groups ☐ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

WAFS and SADIS update

3.5.11 APANPIRG/29 noted that MET SG/22 had reviewed planned changes or developments during the next 12-month period to the World Area Forecast System (WAFS) and the Secure Aviation Data Information Service (SADIS) provided by the World Area Forecast Centre (WAFS) London. MET SG/22 also reviewed preliminary information provided by the WAFS Provider State (United Kingdom) on the next generation WAFS forecast products, which WAFSs would introduce in the next 10 years, as detailed by the SADIS Provider State and WAFS Provider States in MET SG/22 papers WP/11, IP/02, IP/03 and IP/04.

IWXXM implementation

3.5.12 In support of the ICAO SARPs for exchange of MET information in IWXXM form, and development by States of an appropriate Regional implementation plan, MET SG/22 had tasked MET/IE WG with preparation of a Regional status report on the implementation of IWXXM and supporting Air Traffic Service Message Handling System (AMHS) infrastructure [Conclusion MET/SG/22/02 refers].

Development of MET to support ATM

3.5.13 APANPIRG/29 noted that MET SG/22 had reviewed a number of initiatives and experiences of States in research, development and implementation of tailored aviation weather products and services to support air traffic management (ATM) and reduce the impact of weather on aviation systems. The MET SG/22 discussion emphasized the obligation of States/Administrations (under the Convention) to supply users with the meteorological information necessary for the performance of the users' functions and the importance of close liaison between the suppliers and users of meteorological information on matters that affect the provision of meteorological service for international air navigation.

Activities of the Volcanic Ash Advisory Centres (VAAC)

3.5.14 APANPIRG/29 noted that MET SG/22 had reviewed the management reports provided by the designated VAAC Provider States in the APAC Region: Australia, Japan and New Zealand. An increase in the number of volcanic ash advisory messages issued by VACCs coincided

with improved capability of VAACs to identify volcanic ash, using data from the latest generation of meteorological satellite, Himawari-8, which JMA made available to States/Administrations in 2015, increased utilization by VAACs of social media channels and improved communication between VAACs and the State Volcano Observatories.

SIGMET coordination

3.5.15 APANPIRG/29 noted that MET SG/22 decided to task the MET/R WG and MET/S WG to coordinate on the next steps to promote integration and expansion of international SIGMET coordination activities among APAC States/Administrations [Conclusion MET/SG/22/03 refers]. Additionally, MET SG/22 concluded that States providing meteorological information beyond their designated area of responsibility (i.e., original guidance product to support SIGMET issuance) should ensure proper coordination with the authority responsible for the required (ICAO Annex 3-compliant) MET information in the area of responsibility concerned [Conclusion MET/SG/22/04 refers].

Safety Management System (SMS)

3.5.16 APANPIRG/29 noted that MET SG/22 discussed an overview of the implementation and benefits of the SMS at MetService, New Zealand.

Regional guidance material

3.5.17 APANPIRG/29 noted that MET SG/22 decided to adopt the new version of the *ROBEX Handbook* prepared by the ad-hoc group under MET/IE WG, including the decommissioning of the former *Asia/Pacific OPMET Data Banks Interface Control Document (ICD)* [Decision MET/SG/22/05 refers].

3.5.18 MET SG/22 also decided to adopt the updated *Wellington/Darwin VAAC Backup-Test Procedures* developed by New Zealand for inclusion in the *APAC Regional SIGMET Guide* (Sixth Edition, May 2017), Appendix H [Decision MET/SG/22/06 refers].

3.5.19 APANPIRG/29 noted that MET SG/22 supported the APANPIRG's endorsement of the draft *Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management (ATM) Operations*, which the ad-hoc group under MET/R WG had developed and ATM/SG/5 had previously supported as a reference for the provision of MET information to ATM.

3.5.20 APANPIRG/29 also noted that MET SG/22 requested the ad-hoc group to make some editorial changes to the draft and ICAO to upload the document on the ICAO website, as a 'working draft', until formal approval by APANPIRG [Conclusion MET/SG/22/07 refers].

3.5.21 In view of the above, APANPIRG/29 adopted the following Conclusion:

Conclusion APANPIRG/29/25: APAC Regional Guidance for MET Information Supporting ATM		
What: That, APANPIRG approves the <i>Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations</i> , located at the ICAO Asia and Pacific Office website and copied at Appendix A to the APANPIRG/29 Report on Agenda Item 3.5, as a reference for States and Organizations concerned.		Expected impact: ☐ Political / Global ☐ Economic ☐ Environmental ☐ Inter -Regional ☒ Ops/Technical
Why: 1) To assist States in developing and implementing tailored meteorological information and services to support effective air traffic management; and 2) To support follow-up action on Conclusion ATM/SG/5-2: <i>Asia/Pacific Regional Guidance for Meteorological Information Supporting ATM</i> .		
When:	On approval by APANPIRG	Status: Adopted by APANPIRG
Who:	☒ Sub Groups ☐ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

3.5.22 APANPIRG/29 noted that MET SG/22 considered the need for a more thorough review by States of the draft *Guidelines for Operational SIGMET Coordination*, developed by Japan and Singapore under the work plan of the MET/R WG, before the MET SG formally adopts the guidance as an Appendix to the *APAC Regional SIGMET Guide*. MET SG/22 also requested ICAO to upload the document on the ICAO website as a ‘working draft’ and to coordinate feedback from the other ICAO Regions and agreed to keep the draft as a separate document until the MET SG formally adopts it as an Appendix to the SIGMET Guide [Decision MET/SG/22/09 refers].

3.5.23 APANPIRG/29 noted that MET SG/22 proposed the development by ICAO of a comprehensive draft amendment proposal to fill the missing data in the APAC ANP, Tables MET [Decision MET SG/22/11 refers].

Future work programme of the MET SG

3.5.24 MET SG/22 proposed updates to the terms of reference of the MET SG, including the addition of reference information from the *APANPIRG Procedural Handbook*, and updates to the work plan of MET SG based on outcomes of discussion in MET SG/22. In view of the above, APANPIRG/29 adopted the following Decision:

Decision APANPIRG/29/26: Updated terms of reference of the MET SG (including work plan)		
What: That, APANPIRG approves the updated terms of reference of the MET SG (including work plan) located at Appendix B to the APANPIRG/29 Report on Agenda Item 3.5.		Expected impact: ☐ Political / Global ☐ Economic ☐ Environmental ☐ Inter -Regional ☒ Ops/Technical
Why: To improve the description of the working arrangements, procedures and limits of responsibility of the MET SG and to update the work plan to reflect the status of the MET SG’s deliverables, including the responsible parties and target dates, and thus optimize the assistance provided by MET SG to APANPIRG.		
When:	On approval by APANPIRG	Status: Adopted by APANPIRG
Who:	☒ Sub Groups ☐ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

Next meeting

3.5.25 APANPIRG/29 noted that MET SG/22 agreed to schedule the next meeting, MET SG/23, tentatively for the week commencing 17 June 2019. Furthermore, the tentative schedule adopted by MET SG for its Working Groups is as follows:

- 18-20 March 2019 - MET/IE WG/17
- 20-22 March 2019 - MET/S WG/9
- 27 – 31 May 2019 - MET/R WG/8 and MET/ATM Seminar

Airport Low-Level Wind Information (ALWIN) (IP/11)

3.5.26 Japan provided information on the *Airport Low-level Wind Information (ALWIN)* system in operation at Tokyo International Airport and Narita International Airport since April 2017. The ALWIN system provides additional information to the existing requirement for the issuance of wind shear alerts generated by automated, ground-based, wind shear remote sensing or detection equipment at the above locations. The ALWIN system provides pilots, via ACARS, information about the wind characteristics observed in the final approach path, such as wind direction and speed, wind shear, turbulence, etc.

Facilitating Interactions between Space Weather Information Service Providers and Users (IP/12)

3.5.27 Japan provided information on the development of space-weather information service, including the introduction of new SARPs in Amendment 78 to ICAO Annex 3, the operational needs of aviation users for space-weather information and the importance of close coordination between space-weather information service providers and the users.

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

3.6 Other Air Navigation Matters

Past and Future Activities of the ICAO Asia and Pacific Regional Sub-Office (WP/14)

3.6.1 The APAC Regional Sub-Office (RSO) just celebrated its fifth anniversary in Beijing in June 2018. RSO was established with the aim to assist APAC States in ATM implementation mainly on ASM (Airspace Management), PBN (Performance Based Navigation), CMAC (Civil Military ATM Cooperation) and ATFM (Air Traffic Flow Management). Since the last APANPIRG meeting, three new staff joined RSO: one ICAO position for ATFM/A-CDM, one secondee from IATA on ATFM/A-CDM and one secondee from Malaysia on ASM.

3.6.2 The last PBN Implementation Coordination Group (PBNICG) took place in Fiji last May in conjunction with one workshop for Pacific Islands States and another workshop on Quality Assurance. In the last year, a second workshop on PBN for Air Traffic Controllers with the principle of train the trainer was also organized. Besides, to answer needs from some States, a PBN operational approval workshop took place too. A team of four experts also visited Myanmar to assist on PBN implementation. For the coming months, three workshops are planned, one on PBN Safety Assessment (16-18 Oct in Beijing) and next year one on SBAS/GBAS implementation on the purpose of sharing information and experiences, and a third edition of the PBN for Air Traffic Controllers workshop.

3.6.3 To cope with the air traffic growth in the APAC region, a better coordination between States is necessary to increase airspace capacity and efficiency. RSO is then the secretary of the China Sea Traffic Flow Review Group (SCSTFRG) and soon of the Bay Of Bengal Traffic Flow Regional Group (BOBTFRG). A PBN airspace design workshop will be organized in January at RSO.

3.6.4 With the arrival of two new staff on ATFM and A-CDM, RSO was able to continue the secretariat of the Northeast Asia Regional ATFM Harmonization Group (NARAHG), as well as supporting the regional office for the ATFM and A-CDM activities. One of the main task now is to harmonize the different ATFM initiatives in the region to ensure a long term sustainable development of ATFM. RSO remains available to deliver some ATFM/A-CDM workshops on the request of the States.

3.6.5 Regarding the Civil Military ATM cooperation, the support provided by RSO to States is mainly in the shape of workshops so far. Three workshops were recently delivered to China, Malaysia and Thailand and one for all the region to update on the Circular 330 and to make the demonstration of an airspace management support system developed by EUROCONTROL.

3.6.6 The RSO can be contacted through email at APAC-RSO@icao.int or via the website at <https://www.icao.int/APAC/APAC-RSO/>

Agenda Item 4: Regional Air Navigation Deficiencies

4.1 Status of Air Navigation Deficiencies in the Asia/PAC Region

4.1.1 Under the Terms of Reference, the APANPIRG has 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/AIS/SAR fields

4.1.2 APANPIRG/29 noted the List of Air Navigation Deficiencies in the ATM/AIS/SAR field which was reviewed and updated by ATM/SG/6. Appendix A to APANPIRG Working Paper/15 presented the updated List of Air Navigation Deficiencies in the ATM/AIS/SAR fields.

Deficiencies in the AOP field

4.1.3 APANPIRG/29 noted the List of Air Navigation Deficiencies in the AOP field which was reviewed and updated by AOP/SG/2. Appendix B to APANPIRG Working Paper/15 presented the updated List of Air Navigation Deficiencies in the AOP field.

Deficiencies in the CNS field

4.1.4 APANPIRG/29 noted the list of Air Navigation Deficiencies in CNS field which was reviewed and updated by CNS/SG/22. Appendix C to APANPIRG Working Paper/12 presented the updated List of Air Navigation Deficiencies in the CNS field.

Deficiencies in the MET field

4.1.5 APANPIRG/29 noted the list of Air Navigation Deficiencies in MET field which was reviewed and updated by MET/SG/22. Appendix D to APANPIRG Working Paper/15 presented the updated List of Air Navigation Deficiencies in the MET field.

4.1.6 The meeting was provided with information on new deficiencies identified in ATM/AIS/SAR fields and those deficiencies that had been rectified by the States in ATM/AIS/SAR, AOP, CNS and MET fields.

4.1.7 The meeting 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 can be updated. The Regional Office will update the Deficiencies database based on written confirmation provided by the respective Administrations.

4.1.8 The meeting reviewed the Air Navigation Deficiencies and adopted the following Conclusion:

Conclusion APANPIRG/29/27: Update of information in APANPIRG Air Navigation Deficiencies Reporting Form	
What: 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/SAR/AIM, 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.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: The resolution of air navigation deficiencies in the ATM, SAR, AIM, AOP, CNS and MET fields (in the APANPIRG database) have lacked significant 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.	Follow-up: ☒ Required from States
When: official reports providing full details of the corrective actions taken where deficiencies have been resolved be reported to sub-groups in 2019.	Status: Adopted by PIRG
Who: ☐ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

Agenda Item 5: Future Work Programme

APANPIRG Work Programme 2019+ (WP/16)

5.1.1 APANPIRG/29 agreed with the tentative schedule of meetings for the rest of 2018, 2019 and 2020 and noted that a formal letter of invitation will normally be issued by the Secretariat at least 2 months prior to each event.

5.1.2 The Secretariat informed the meeting that Nepal has proposed to hold the 56th DGCA Conference from 26 to 30 August 2019 in Nepal and noted that 40th ICAO Assembly to be held in September/October 2019. In view of the above the dates for APANPIRG/30 and RASG-APAC/9 will be published later.

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2018 – OUTSTANDING MEETINGS		
Meetings	Tentative Dates	Venue
CSMMTC - MCIS	24 – 28 September	Bangkok
CSMMTC - MCIS	1 – 5 October	Nepal
CSMMTC - MCIS	October	Indonesia
CSMMTC - MCIS	October	Vanuatu
APAC-AIG/6 and APAC AIG Workshop	8 – 12 October	Bangkok
APAC-AIG/6	15 – 19 October	Bangkok
PBN Safety Assessment Workshop	16 – 18 October	Beijing, China
AIS-AIM	22 – 24 October	Denarau Island, Nadi, Fiji
55 th DGCA Conference	22 – 26 October	Denarau Island, Nadi, Fiji
SCSTFRG/7	5 – 7 November	Manila
Basic Building Blocks for Aviation Safety Block Upgrades Workshop	January (TBC)	Bangkok
APRAST 13	3 – 7 December	Bangkok
Surveillance Workshop and SEA/BOB ADS-B WG/14	5 – 9 November	Bangkok
Aerodrome Certification Course	19 – 23 November	Bangkok
Symposium on ATM Automation System	22 – 23 November	Nanjing, China
Bay of Bengal Traffic Flow Review Group/1	26 – 28 November	Bangkok
ATFM/IR/SWG/2	End of November	Singapore
IWXXM workshop	November (TBC)	Bangkok
Aerodrome Certification incorporating PANS-Aerodromes Workshop	3 – 7 December 2018	Nadi, Fiji
PSIDS	31 December	TBD

(Note: Refer Table below for Acronyms)

2019 – MEETINGS, WORKSHOPS AND SEMINARS		
Meetings	Tentative Dates	Venue
APWHM/WG/1 Meeting	January (TBC)	Bangkok
PBN Airspace Design Workshop	21 – 25 January	Beijing, China
CRV OG/5	January	Hong Kong, China
CSMMTC - MCIS	January	Beijing, China
AP-ADOTF/1	February (TBC)	Bangkok
APUASTF/3	February	TBD
AOPC SWG/2	March (TBC)	Bangkok
MET/IE WG/17	18 – 20 March	Bangkok
MET/S WG/9	20 – 22 March	Bangkok
SAIOACG/9	26 – 29 March	Bangkok
DAPs WG/2	March	TBD
SBAS/GBAS Implementation Seminar	March (TBC)	Beijing, China
SCSTFRG/8	March (TBC)	Beijing
APA TF/5 (AIDC TF)	March	TBD
PBNICG/6	March/April (TBC)	TBD
ATFM/IR/SWG/3	Beginning of April	Japan
SEACG/26	1 – 4 April	Bangkok
ATFM/SG/9	22 – 26 April	Bangkok
APA-CDM/TF/4	22 – 26 April	Bangkok
SURICG/4	April/May	TBD
APAAWG/1	May (TBC)	Bangkok
SWIM TF/3	6 – 10 May	Bangkok
CRV OG/6	8 - 10 May	Bangkok
ACSICG/6	13 – 15 May	Bangkok
AP SAR/WG/4	14 – 17 May	Bangkok
MET/R WG/8 and MET/ATM Seminar	27 – 31 May	Bangkok
SRWG/6	May (TBC)	Bangkok
PBN Workshop for Air Traffic Controllers	May/June (TBC)	TBD
APRAST/14	May	Bangkok
AAITF/14	3 – 7 June	Bangkok
VOLCEX/SG/6	13 – 14 or 17 – 18 June (TBC)	Bangkok
MET/SG/23	During week comm.17 June	Bangkok
AOP/SG/3	24 – 28 June	Bangkok
FIT-Asia/9	25 – 28 June	Bangkok
BOBTFRG/2	June	TBD
RASMAG/24	9 – 12 July	Bangkok
CNS SG/23	8 – 12 July	Bangkok
PIRG & RASG Coordination and PIRG Midterm Review	22 – 26 July	Bangkok
ATM/SG/7	5 – 9 August	Bangkok
56 th DGCA Conference	26 to 30 August	Nepal
ATFM/IR/SWG/4	August	TBD
APANPIRG/30 and RASG	2 – 6 September	Bangkok

2019 – MEETINGS, WORKSHOPS AND SEMINARS		
Meetings	Tentative Dates	Venue
Aerodrome PMS Workshop	23 – 27 September	Bangkok
SCSTFRG/9	October (TBC)	TBD
Aerodrome SMS Seminar	November (TBC)	TBD
SEA/BOB ADS-B WG/15	November	TBD
APRAST/15	December	Bangkok

2020 – MEETINGS, WORKSHOPS AND SEMINARS		
Meetings	Tentative Dates	Venue
APWHM/WG/2	January	Bangkok
AP-ADOTF/2	February	Bangkok
APUASTF/4	February	TBD
AOPC SWG/3	March	Bangkok
MET/IE WG/18	March	Bangkok
MET/S WG/10	March	Bangkok
SAIOACG/10	March	Bangkok
DAPs WG/3	March	TBD
APA TF/6 (AIDC TF)	March	Bangkok
PBNICG/7	March/April/TBC	TBD
SEACG/27	April	TBD
ATFM/SG/10	April	TBD
APA-CDM/TF/5	April	Bangkok
SURICG/5	April/May	TBD
APAAWG/2	May	Bangkok
SWIM TF/4	May	Bangkok
CRV OG/7	May	TBD
ACSICG/7	May	Bangkok
APSAR/WG/5	May	TBD
SRWG/7	May	Bangkok
APRAST/16	May	Bangkok
MET/R WG/8	May/June	TBD
AAITF/15	June	TBD
VOLCEX/SG/7	June	Bangkok
MET/SG/24	June	Bangkok
AOP/SG/4	June	Bangkok
FIT-Asia/10	July	Bangkok
RASMAG/25	July	Bangkok
CNS SG/24	July	Bangkok
ATM/SG/8	July/August	Bangkok
APANPIRG/31 and RASG 10	September	Bangkok
57 th DGCA Conference	October/November	Bangladesh
SEA/BOB ADS-B WG/16	November	TBD
APRAST/17	December	Bangkok

(Note: Refer Table below for Acronyms)

ACRONYMS

AAITF	Aeronautical Information Services – Aeronautical Information Management Implementation Task Force
ACSICG	Aeronautical Communication Services (ACS) Implementation Co-ordination Group
ADS-B SITF	ADS-B Study and Implementation Task Force
AOPC SWG	Aerodrome Operational Personnel Competency Small Working Group
AOP/SG	Aerodrome Operations and Planning Sub Group
APAAWG	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-ADOTF	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/1	Asia Pacific Unmanned Aircraft System Task Force
APWHM/WG	Asia/Pacific Wildlife Hazard Management Working Group
ATFM/SG	Air Traffic Flow Management Steering Group
ATM/SG	ATM/Sub Group
ATN IC G	Aeronautical Telecommunication Network Implementation and Coordination Group
CNS/SG	CNS Sub-Group of APANPIRG
CRV	Common Regional Virtual Private Network (VPN)
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)
FIT-Asia	FANS Interoperability Team-Asia
FPP SCM	Flight Procedure Programme Steering Committee
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
WASWG	Water Aerodromes Small Working Group

Agenda Item 6: Any other business

Report of the Review of Effectiveness of Sub Groups' Empowerment to adopt Conclusions and Decisions (WP/17)

6.1.1 In response to ICAO APAC's State Letter Ref.: AN 3/3 – AP142/17 (AGA) dated 6 November 2017 requesting States to nominate members for the Small Working Group, Australia, China, Hong Kong China, Japan, Lao PDR, Singapore and USA nominated members for this Working Group.

6.1.2 Small Working Group were provided Conclusions and Decisions adopted by the APANPIRG Sub Groups meetings held in 2017 and partially in 2018 for review.

6.1.3 An analysis of the decisions and conclusions adopted by the APANPIRG Sub Groups meetings were conducted using Tables (**Tables 1 to 4**) provided by the Regional Office which further includes comments received from members of the Small Working Group. **Table 5** includes APANPIRG/28 Conclusions and Decisions which the members considered that those Conclusions/Decisions would have been taken by the respective APANPIRG Sub Group(s). **Table 6** presents Conclusions/Decisions adopted by the APANPIRG Sub Groups related to Regional Guidance Materials (technical/operational) with the materials not formally gone through the APANPIRG. **Tables 1 to 6** were provided in **Appendices 1 to 6** to Working Paper 17.

6.1.4 The APANPIRG/29 noted the outcomes of the review conducted by the Small Working Group and summarized as follow:

- 1) APANPIRG Subgroup should adopt Conclusions/Decisions related to:
 - a) any amendment to TOR, including an extension of time of Working Group/Taskforce formed under relevant Subgroup; and
 - b) all technical and operational aspects of Subgroup's work within its TOR.
- 2) APANPIRG Subgroup should formulate Draft Conclusions/ Draft Decisions and submit to APANPIRG for adoption:
 - a) any amendment to TOR, including an extension of time of Working Group/Taskforce formed under TOR approved by the APANPIRG;
 - b) APANPIRG Air Navigation Deficiencies; and
 - c) slow progress by States in implementation aspects.
- 3) ICAO Secretariat would indicate clearly in the report of the Sub-group meeting on how the cross Sub-group Conclusions/Decisions to be coordinated and endorsed; and
- 4) As per empowerment principle, APANPIRG Subgroup or Taskforce/Working Group was empowered to make Conclusions/Decisions related to regional guidance material for publication in ICAO APAC website.

6.1.5 Noting that the empowerment to APANPIRG Sub Groups to adopt Conclusions and Decisions on technical/operational matters has been working effectively and considering its benefit for effectiveness of APANPIRG work, the meeting agreed on following Conclusion:

Conclusion APANPIRG/29/28: Empowerment to adopt Conclusions and Decisions on purely technical/operational matters by APANPIRG's Sub Groups		
What: That, the empowerment to APANPIRG Sub Groups to adopt Conclusions and Decisions on technical/operational matters has been working effectively and considering its benefit for effectiveness of APANPIRG work: 1) APANPIRG Subgroup should adopt Conclusions/Decisions related to: a) any amendment to TOR, including an extension of time of Working Group/Taskforce formed under relevant Subgroup; and b) all technical and operational aspects of Subgroup's work within its TOR. 2) APANPIRG Subgroup should formulate Draft Conclusions/ Draft Decisions and submit to APANPIRG for adoption: a) any amendment to TOR, including an extension of time of Working Group/Taskforce formed under TOR approved by the APANPIRG; b) APANPIRG Air Navigation Deficiencies ¹ ; and c) report on slow progress by States in implementation aspects. 3) ICAO Secretariat would indicate clearly in the report of the Sub-group meeting on how the cross Sub-group Conclusions/Decisions to be coordinated and endorsed; and 4) As per empowerment principle, APANPIRG Subgroups or Taskforce/Working Groups are empowered to make Conclusions/Decisions related to regional guidance material for publication in ICAO APAC website. ¹ <i>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.</i>		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why:	For effective work of APANPIRG	Follow-up: ☐ Required from States
When:	5 Sept. 2019	Status: Adopted by PIRG
Who:	☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

Workshop Session – Improving State’s engagement in Regional air navigation planning and implementation

6.1.6 The success of APANPIRG in meeting its objectives to support air navigation planning and implementation in the APAC Region depends on effective interactions between APAC States and Administrations and the various mechanisms used within the Regions for the purpose of Air Navigation Services infrastructure improvement.

6.1.7 To promote effective engagement of States in Regional air navigation planning and implementation, and ultimately the ongoing success of the APANPIRG program, the ICAO Secretariat took the opportunity during APANPIRG/29 to facilitate a workshop for APANPIRG participants to address two main issues: 1) State Response Effectiveness, and 2) Implementation Issues. APANPIRG/29 participants were divided into two groups and designated each of the two “Breakout Groups” to address one of the two main issues.

6.1.8 The objective of the workshop was for the participants to formulate proposals for actions by States, which address the issues discussed in the workshop. The workshop was facilitated by the ICAO Secretariat. The concept note of the workshop is provided in **Appendix A** to the Report on Agenda Item 6.

6.1.9 APANPIRG/29 reviewed the proposals presented by Breakout Groups’ Rapporteurs to the plenary session. Breakout Group discussions on issues and recommendations are provided in **Appendix B** to the Report on Agenda Item 6. The meeting subsequently adopted the following Conclusions and Decisions:

Conclusion APANPIRG/29/29: State Handling of ICAO Correspondence		
What: That, States and Administrations are urged to review and implement an improved focal point system for receipt, dissemination and response to ICAO correspondence with consideration on: a) Process control for systematic tracking and management of ICAO State letters within State and APAC; b) Nomination of a competent focal point with appropriate training; and c) Additional focal point support as necessary.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To improve the reliability and effectiveness of ICAO and State communication.		Follow-up: ☒ Required from States
When: 5 Sept. 2019.		Status: Adopted by PIRG
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:		

Conclusion APANPIRG/29/30: State Actions on Air Navigation Deficiency		
What:	That, States are urged to 1. Ensure the nominated Air Navigation Deficiency point of contact is suitably qualified and empowered to engage with all internal stakeholders to action the resolution of deficiencies; 2. Conduct education activities to ensure all stakeholder organizations are aware of the obligations of the State under the Convention; 3. Keep the relevant APANPIRG Sub-Groups informed of their corrective actions on identified deficiencies; and 4. Provide more information on the reasons for lack of progress, reasons for non-reporting, and internal priorities related to deficiency resolution.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To improve the process for State and APANPIRG action to track and resolve Air Navigation Deficiency.	Follow-up: ☒ Required from States	
When: 5 Sept. 2019.	Status: Adopted by PIRG	
Who:	☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

Decision APANPIRG/29/31: APANPIRG Actions on Air Navigation Deficiency		
What:	That, APANPIRG, its Sub-Groups and technical bodies: 1. Prioritize Air Navigation Deficiency or deficiency areas annually; 2. Seeking support of States to assist States with prioritized deficiency areas; and 3. Consider wherever possible locating workshop/seminar in sub-regional geographical areas of particular deficiency interest.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why:	To improve the APANPIRG response to, and Regional direction in, prioritizing and resolving Air Navigation Deficiency.	Follow-up: ☐ Required from States
When:	5 Sept. 2019	Status: Adopted by PIRG
Who:	☒ Sub groups ☐ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

The Chairman of APANPIRG and the Regional Director of ICAO APAC Office thanked all participants for their active participation in the meeting.

Declaration of Asia Pacific Ministerial Conference on Civil Aviation

- 1) We, the Ministers from the Asia and Pacific States, responsible for Civil Aviation, met in Beijing, China from 31 January to 1 February 2018, on the occasion of the Asia Pacific Ministerial Conference on Civil Aviation, organized by the International Civil Aviation Organization (ICAO);
- 2) Mindful of the obligations as Contracting States to the Convention on International Civil Aviation signed on 7th December 1944 (also known as the Chicago Convention);
- 3) Considering the importance of air transportation world-wide for social and economic development (the Global Air Transport Industry supports almost 62.7 million jobs worldwide and contributes US\$ 2.7 trillion to Global Gross Domestic Product (GDP), equivalent to 3.5% of global GDP and US\$ 664.4 billion aviation direct economic impact);
- 4) Recognising that the Asia and Pacific Region has become the world's largest aviation market in terms of available seat-kilometres and generates the world's second largest share of international revenue passenger-kilometres, and will continue to grow with corresponding air traffic capacity, efficiency and safety challenges;
- 5) Recognising that there are various programmes, objectives and targets currently being pursued under the ICAO "No Country Left Behind (NCLB)" initiative to assist States in capacity development in order for States to derive maximum social economic benefits from aviation, let aviation contribute ultimately to the realisation of the international development priorities, particularly the United Nations 2030 Agenda for Sustainable Development, and play its important role in the building of a community of shared future for mankind;
- 6) Recognising that the ICAO Global Air Navigation Plan (GANP) and the Global Aviation Safety Plan (GASP) set out regional expectations, priorities and targets for States, agreed at regional fora such as the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) and the Regional Aviation Safety Group (RASG-APAC) and reflected in national planning frameworks;
- 7) Recognising that there are existing bilateral and multi-lateral working relationships and platforms, such as the Asia and Pacific Directors General of Civil Aviation (APAC DGCA) Conference, APANPIRG, RASG-APAC; and ICAO-led initiatives (e.g. Aviation Safety Implementation Assistance Partnership (ASIAP), the Combined Action Teams (CAT));
- 8) Recognising the importance of active participation of States through their experts attending ICAO fora and other international meetings, training, seminar and workshop events to advance civil aviation development in the Region;
- 9) Acknowledging that the existing regional relationships and partnerships are evolving with meaningful technical cooperation and assistance programmes (e.g. Cooperative Development of Operational Safety and Continuing Airworthiness Programmes (COSCAPs), Flight Procedure Programme (FPP));

- 10) Mindful of the importance and impact of aviation safety and efficient air navigation services on the sustainable development of air transport;
- 11) Recognising that the ICAO Universal Safety Oversight Audit Programme (USOAP) has been effective in helping States focus on safety oversight capabilities and to address gaps in the implementation of ICAO Standards and Recommended Practices (SARPs) and regulatory safety oversight;
- 12) Considering the Asia and Pacific Region is diverse (e.g. in terms of capacity and civil aviation development with USOAP Effective Implementation (EI) scores ranging from 5% to over 90%), there is a compelling need for stronger regional cooperation, partnerships and engagement to continuously improve aviation safety;
- 13) Recognising the ICAO “Next Generation of Aviation Professionals (NGAP)” initiative aimed at addressing the need for aviation professionals in various fields and the importance of having adequate qualified and competent aviation professionals to meet the challenges of the significant aviation growth experienced by the Region;
- 14) Considering the need to support the timely implementation of the Asia/Pacific Seamless Air Traffic Management (ATM) Plan and its elements to enhance safety and efficiency of air navigation services to cater for the projected air traffic growth in the Region;
- 15) Mindful of the need to take into account resolutions agreed at future ICAO Assembly Meetings including those on GASP and GANP;
- 16) The Ministerial Conference agrees to the Beijing Declaration and the Ministers commit to the following:

1.0 Aviation Safety

1.1 Commit to:

- (a) Progressively enhance safety oversight capability to achieve a USOAP EI score higher or equal to the global average by 2022;
- (b) Implement an effective State Safety Programme (SSP) by 2025;
- (c) Endeavour not to have any Significant Safety Concerns (SSCs) under the USOAP Continuous Monitoring Approach (CMA), and to resolve any future SSCs within the time frame agreed with ICAO;
- (d) Certify all aerodromes used for international operations by 2020;
- (e) Use data driven methodologies to identify high risk categories of occurrences (e.g. runway safety, loss of control in flight and controlled flight into terrain), and implement collaborative solutions to reduce accident rates and fatalities in the Region; and

- (f) Include aviation safety in national planning frameworks such as National Development Plans (NDPs) supported by robust Civil Aviation Master Plans.

1.2 Promote regional government and industry collaboration for sharing of best practices in safety management through the Regional Aviation Safety Group (RASG).

2.0 Air Navigation Services

2.1 Commit to implementation by 2022 of the Asia/Pacific Seamless Air Traffic Management (ATM) Plan to enhance ATM capacity and harmonisation in the Region, including a focus on:

- (a) Transitioning from Aeronautical Information Service (AIS) to Aeronautical Information Management (AIM) System;
- (b) Performance Based Navigation (PBN) implementation;
- (c) Common ground/ground telecommunication infrastructure to support Air Navigation Services (ANS) applications;
- (d) An enhanced level of civil/military cooperation;
- (e) Enhanced surveillance capability including Automatic Dependent Surveillance-Broadcast (ADS-B) technology;
- (f) Air Traffic Flow Management/Collaborative Decision Making (CDM) implementation for high density airports; and
- (g) Air navigation in national planning frameworks such as National Development Plans (NDPs) supported by National Air Navigation Plans.

2.2 Promote sharing of best practices in the provision of ANS including Aeronautical Search and Rescue (SAR), Meteorological Services for International Air Navigation (MET) and Air Traffic Flow Management (ATFM) through regional cooperation and enhanced coordination.

3.0 Accident Investigation

3.1 In accordance with the Chicago Convention, commit to either establish an accident investigation authority that is independent from State aviation authorities and other entities that could interfere with the conduct or objectivity of an investigation or where appropriate develop a bilateral, sub-regional or regional partnership to support the establishment of accident investigation capabilities to serve the Region, sub-region or State.

4.0 Human Resource Development

4.1 In line with the ICAO initiative on “Next Generation of Aviation Professionals (NGAP)”, accord priority to human capital development to provide sufficient qualified and competent aviation professionals to support the Region’s growing needs, including where appropriate:

APANPIRG/29

Appendix A to the Report on Agenda Item 1A

- (a) Establish access to quality training; and
- (b) Encourage sharing of resources bilaterally and/or multi-laterally as well as with industry partners.

4.2 Promote the attraction of new talent and the retention of trained, qualified and experienced personnel among State Aviation Organisations (e.g. regulators, air navigation service providers).

—END—

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/1 A	Safety Management Implementation	That, States, regional and international organizations are invited to share tools and examples which support effective safety management implementation to be considered for posting on the ICAO safety management implementation website.	ICAO APAC ICAO HQ APAC States International Organizations	IOM to ICAO HQ State Letter Action in accordance with the Conclusion	October 2017 Not specified Not specified	SL AN 3/3 – AP134/17 (AGA) dated 6 October 2017 SMI Website has been launched 17 Nov. 2017 COMPLETED	To note.
D 28/2 A & B	APA-CDM/TF Terms of Reference	That, the revised APA-CDM/TF Terms of Reference at Appendix A to the Report on Agenda Item 3.1 be adopted.	ICAO APAC	State Letter Notify APA-CDM/TF	October 2017 November 2017	SL AN 3/3 – AP135/17 (AGA) dated 6 October 2017 APA-CDM/TF/2Hong Kong China, 29 November to 1 December 2017 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
D 28/3 A & B	Amendment of Water Aerodrome Small Working Group's TOR	That, amended WASWG Terms of Reference placed at Appendix B to the Report on Agenda Item 3.1 be adopted.	ICAO APAC	State Letter Notify WASWG	October 2017 February 2018	SL AN 3/3 - AP136/17 (AGA) dated 6 October 2017 WASWG/3Hulh ule, Maldives, 6 - 8 February 2018 COMPLETED	
D 28/4 A & B	ATFM/SG Terms of Reference	That, the ATFM/SG Terms of Reference at Appendix A to the Report on Agenda Item 3.2 be adopted.	ICAO APAC	State Letter Notify ATFM/SG	October 2017 May 2018	Ref. T 3/10.0 – AP114/17 dated 28 September 2017 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/5 A & B	FIR/SRR Air Navigation Plan Review	That, Asia/Pacific States and Administrations having responsibility for the provision of services within a Flight Information Region (FIR) or Aeronautical Search and Rescue Region (SRR), should conduct a review of the ICAO data related to the FIR or SRR and provide a verification to the ICAO Regional Office as early as possible, but in any event not later than 31 December 2017.	ICAO APAC APAC States	State Letter with Implementation Guidance Material (GM) Action in accordance with the Conclusion	October 2017 31 December 2017	Ref. T 3/10.0 – AP115/17, 28 September 2017 COMPLETED	
D 28/6 A & B	APUAS/TF Terms of Reference	That, the amended Terms of Reference for the Asia/Pacific UAS Task Force at Appendix B to the Report on Agenda Item 3.2 be adopted.	ICAO APAC	State Letter Notify APUAS/TF	October 2017 August 2018	Ref. T 3/10.0 – AP114/17, 28 September 2017 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/7 A & B	State Actions to Ensure the Quality Management of Aeronautical Information	That, States are urged to: 1. Examine and update where necessary the relevant primary legislation and aviation regulations to ensure that all originators and publishers of aeronautical information are required to comply with the Annex 15 standards and recommended practices relating to quality management and promulgation of aeronautical information; 2. Examine all available guidance for quality management of aeronautical information, including the <i>Guidance Manual for Aeronautical Information Services in the Asia/Pacific Region</i> ; and 3. Ensure that robust quality management procedures are developed, implemented and used by all originators and publishers of aeronautical information, supported by formal agreements to ensure timeliness and quality.	ICAO APAC APAC States	State Letter with Implementati on GM Action in accordance with the Conclusion	October 2017 Not specified	Ref. T 3/10.0 – AP116/17, 28 September 17 COMPLETED	
C 28/8 A & B	Proposal for Amendment to the Asia and Pacific Regions Air Navigation Plan	That, ICAO prepares and circulates for Regional Air Navigation Agreement a proposal for amendment (PfA) to the Asia and Pacific Regions Air Navigation Plan Volume II, as provided in Appendix C to the Report on Agenda Item 3.2.	ICAO APAC ICAO APAC	State Letter (Circulation of PfA of ANP Vol. II) Implementati on Guidance Material	October 2017	Ref. T 3/10.0 – AP116/17, 28 September 2017 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/9 A & B	AIM-specific Working Group to Finalize ICAO Guidance Material	That, ICAO be urged to form an AIM-specific working group to focus on the finalization of overdue AIS-related guidance material, with Doc 9839 <i>Manual of the QMS for AIM</i> , Doc 9991 <i>AIM Training Development Manual</i> and Doc 8126 <i>Aeronautical Information Service Manual</i> having the highest priority.	ICAO APAC ICAO APAC ICAO HQ	IOM to HQ Implementati on Guidance Material Action in accordance with the Conclusion	October 2017 Not specified	Ref. T 3/10.0 – AP116/17, 28 September 17 Working Group formed under AIM Panel COMPLETED	Consider progress made on the readiness of AIM guidance material and take action as required.
C 28/10 A & B	Search and Rescue Capability Focus Areas	That, given the continuing overall poor levels of implementation of Search and Rescue (SAR) coordination with adjacent States, effective SAR regulatory oversight and the training of both SAR inspectors and personnel that provide the SAR services, Asia/Pacific States should provide greater resources and high level support to enable a focus on these areas.	ICAO APAC APAC States	State Letter with Implementati on GM Action in accordance with the Conclusion	October 2017 Not specified	Ref. T 3/10.0 – AP117/17, 28 September 17 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/11 A & B	PBCS Operational Authorizations	That, noting the expected implementation of Performance-Based Communications and Surveillance (PBCS) provisions of ICAO Annexes, PANS and Guidance Material by not later than 29 March 2018, Asia/Pacific States are urged to: 1. Expedite the development and implementation of the PBCS authorization process; 2. Share information through the ICAO Asia/Pacific Regional Office on the availability of PBCS regulatory material and on the expected readiness of their aircraft operators; and 3. Monitor communications and surveillance performance against RCP240 and RSP 180 specifications as described in Doc 9869 – <i>PBCS Manual</i> for all individual aircraft using datalink in their area of responsibility, and make the performance data available on request to all States of Registry.	ICAO APAC APAC States	State Letter with Implementati on GM Action in accordance with the Conclusion	October 2017 29 March 2018	Ref. T 3/10.0 – AP118/17, 28 September 17 COMPLETED	To note.

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/12 A & B	Management of Non-RVSM Aircraft	That, due to the continuing problem of non-Reduced Vertical Separation Minimum (RVSM) aircraft operating inappropriately within the RVSM stratum on a long-term basis: a) Asia/Pacific States should respond in a timely manner to Regional Monitoring Agency (RMA) recommendations; and b) Asia/Pacific States and Administrations should enact policies, legislation (including appropriate enforcement actions), and procedures to ensure such non-approved aircraft are identified and refused entry into the RVSM stratum unless specifically exempted, or they have Air Traffic Control (ATC) approval, and c) ICAO should survey Asia/Pacific States and Administrations to determine whether such policies, legislation and procedures to exclude non-RVSM aircraft have been implemented; and d) RMAs should treat aircraft with an unverified RVSM approval status by its State of Approval for more than one month, starting from the first RMA notification, as a non-RVSM approved aircraft and that information provided to relevant State authorities for appropriate action; and e) RMAs should be empowered by APANPIRG to have direct communication with concerned ministries/authorities if required in the event of inadequate action by the State.	ICAO APAC APAC States ICAO APAC RMAs	State Letter with Implementation on GM Action in accordance with the Conclusion Conduct survey Action in accordance with the Conclusion (d)	October 2017 Not specified 31 December 2017 Not specified	Ref. T 3/10.0 – AP119/17, 28 September 17 COMPLETED	To note.

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/13 A & B	Asia/Pacific Region Data Link Performance Monitoring	That, IPACG/FIT and ISPACG/FIT are requested to provide to the RASMAG meeting each year a list of IPACG and ISPACG States that have: 1) made arrangements for the reporting and analysis of data link problems to a competent CRA as identified by the Regional Airspace Safety Monitoring Advisory Group (RASMAG); and 2) Reported data link problems to the CRA; and 3) provided data link problem analysis reports to a recognized FANS Interoperability/Implementation Team (FIT); and 4) provided data-link performance analysis reports to a recognized FIT.	ICAO APAC APAC States (IPACG/FIT and ISPACG/FIT)	State Letter with Implementati on GM Action in accordance with the Conclusion	October 2017 Not specified	Ref. T 3/10.0 – AP119/17, 28 September 17 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/14 A & B	ANS Deficiencies Relating to Data Link Performance Monitoring and Analysis	That, an Air Navigation Deficiency should be raised against non-implementation of the relevant provisions of Annex 6, Annex 11and PANS/ATM when any Asia/Pacific Administration has implemented operational ADS-C/CPDLC services and: a) has not made arrangements for the reporting and analysis of data link problems to a competent CRA as identified by the Regional Airspace Safety Monitoring Advisory Group (RASMAG); or b) does not report data link problems to the CRA; or c) does not provide data link problem analysis reports to a recognized FANS Interoperability/Implementation Team (FIT); or d) does not provide data-link performance analysis reports to a recognized FIT at least once annually. This Conclusion supersedes Conclusion APANPIRG/26/25.	ICAO APAC APAC States	State Letter with Implementati on GM Action in accordance with the Conclusion	October 2017 Not specified	Ref. T 3/10.0 – AP118/17, 28 September 17 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/15 A & B	PBCS-Related Proposals for Amendment to Regional Supplementary Procedure	That, ICAO Asia/Pacific Regional Office is requested to circulate to States and then submit for consideration by the Council of ICAO the Proposals for Amendment to Regional Supplementary Procedures MID/ASIA and PAC to support performance-based separation.	ICAO APAC ICAO APAC	State Letter (Circulation of PfA of Regional Supplementar y Procedures MID/ASIA and PAC to support performance- based separation) Implementati on Guidance Material	October 2017	Ref. T 3/10.0 – AP118/17, 28 September 17 COMPLETED	To note.
C 28/16 A & B	Upgrade AMHS to support IWXXM traffic	That, In order to support the requirement to exchange MET information in IWXXM format, States/Administrations be urged to upgrade AMHS systems (AMHS server and User Agent) by November 2020 to either Extended AMHS or Basic ATS Message Handling Service plus File Transfer Body Parts sub-set of extended AMHS for Binary data exchange (FTBP) functional groups as defined in Doc 9880 Part IIB section 3.4.1.	ICAO APAC APAC States	State Letter with Implementati on GM Action in accordance with the Conclusion	30 December 2017 November 2020	T8/2.11: AP050/18 (CNS) 10 May 18 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
D 28/17 A & B	Dissolution of CRV Task Force	Noting that the terms of reference b/ to d/ have been completed and that completion of a/ and e/ will be performed by CRV OG on the basis of mature CRV implementation plan, and CRV Operating Manual, That, the CRV Task Force be dissolved.	ICAO APAC	State Letter	October 2017	T8/2.11 - AP139/17 (CNS) 10 Oct.17 COMPLETED	
C 28/18 A & B	Revised Strategy for Implementation of Communication systems to support Air Navigation Service	That, the revised Strategy for implementation of Communication systems to support Air Navigation Service provided in Appendix C to the Report on Agenda Item 3.4 is adopted.	ICAO APAC APAC States	State Letter with Implementati on GM Action in accordance with the Conclusion	October 2017 Not specified	T8/2.11:AP141/17 (CNS) 17 Oct.17 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	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 Implementati on GM Action in accordance with the Conclusion	October 2017 31 March 2018	Concrete proposal for implementation was followed up by CRV OG/4. Contacts with Administrations concerned. ONGOING	
C 28/20 A & B	Revised ANP Table CNS II APAC-1 – AIDC Implementation Plan	That, the revised Table CNS II APAC-1-AIDC Implementation Plan provided in Appendix E to the Report on Agenda Item 3.4 be amended in accordance with the established procedure.	ICAO APAC	State Letter (circulation of proposal for amendment of the ANP)	30 December 2017	Approved: AN 3/3 – AP038/18 (CNS/MET/AIM) 8 June 18 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/21 A & B	Coding of Asia-Pacific SBAS service provider IDs in the avionics	That, ICAO, with the support of ICCAIA, be urged to: a) coordinate the appropriate coding of Asia-Pacific SBAS service provider IDs in the avionics as early as possible through the implementation of ARINC Nav data specification (revision 21); and b) advise about the advantages and disadvantages to use the SBAS service provider ID 15 currently available with revision 20 as a workaround pending the implementation of a).	ICAO APAC ICAO	IOM to HQ Letter to ICCAIA	October 2017 30 December 2017	Coordinated with NSP. SBAS Service Provider Identifier was included in the draft proposed amendment of Annex 10, Vol I, Appendix B and Attachment D. COMPLETED	To note.

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/22 A & B	Establishment of National PBN stakeholders forums	Noting that the insufficient articulation between the regulatory and implementation processes is a major cause for the slow implementation of PBN, a lack of efficiency and an increased risk in operations:	ICAO APAC	State Letter with Implementation on GM	October 2017	T 8/5.15- AP140/17 (CNS) 12 Oct. 2017	To note.
		That, States be urged to establish a national PBN stakeholders forum (or a similar mechanism) to review and coordinate on an ongoing basis: a) the national PBN implementation and regulatory roadmaps, taking into account the global and regional objectives, the fleet readiness, the best equipped/best served principle, and the reduction of environmental impacts; b) the training policies and programmes for all stakeholders; c) the necessary changes to the legal and regulatory framework; and d) the expected and actual benefits of PBN implementation in terms of safety, efficiency, schedule reliability, CO ₂ emissions and noise exposure, airport accessibility, and reduced infrastructure costs. The forum should include regulator, ANSP, aerodrome operators, Instrument Flight Procedure Design organizations, all airspace users, and as required communities impacted by noise exposure and carbon emission levels. <i>Note: the PBN implementation plan is an appropriate tool to support such a national coordination; IFSET is an appropriate tool to demonstrate the expected and actual benefits of PBN implementation.</i>	APAC States	Action in accordance with the Conclusion	16 March 2018	COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/23 A & B	Update of the Catalogue of Flight Validation and Inspection Service providers in Asia and Pacific Region	That, a) States provide their flight validation and inspection unit's capabilities to reflect PBN procedure flight validation and flight inspection capabilities through an ICAO RSO's survey; and b) ICAO Asia and Pacific Regional Office update the Catalogue of Flight Inspection Units Asia and Pacific Regions based on the survey outcomes.	ICAO APAC APAC States ICAO RSO	State Letter with Implementati on GM Action in accordance with the Conclusion (a) Action in accordance with the Conclusion (b)	October 2017	T8/2.10 : AP111/17 (CNS) 19 Sep17 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/24 A & B	Revised Template for Promulgation of ADS-B Avionics Equipage Requirements	That, 1) States intending to implement ADS-B based surveillance service for a defined airspace and having not published regulations be urged to promulgate mandating rules for ADS-B Avionics Equipage Requirements as soon as possible using the revised Template provided in Appendix F to the Report on Agenda Item 3.4; 2) States that have implemented ADS-B based surveillance services are also urged to update their ADS-B avionics equipage requirements to align with the template; <i>Note: States are urged to include at least the standards stated in the template. States may include other standards allowed by the State's regulations.</i> 3) The template adopted under Conclusion APANPIRG/26/42 be superseded by the revised template; and 4) The relevant parts in the ADS-B Implementation and Operations Guidance Document (AIGD) be updated accordingly.	ICAO APAC APAC States ICAO APAC	State Letter with Implementati on GM Action in accordance with the Conclusion Update the relevant parts of AIGD	October 2017 1) and 2): With sufficient lead time before mandate so that operators can equip 30 December 2017	AP028/18 (CNS) 9 Mar.18 July 2017 T 8/10.21 : AP085/17 (CNS) 08 August 2017 on revised AIGD COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	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 on GM	October 2017	Being processed (waited for Asia/Pac) ONGOING	
D 28/26 A & B	Dissolution of APAC/NAT ADS-C reporting intervals Task Force	That, noting that the assigned tasks having been completed and proposals for amendment to ICAO relevant document being forwarded to appropriate ICAO groups for consideration, the APAC/NAT ADS-C reporting intervals Task Force is dissolved.	ICAO APAC	State Letter (Notify to Members of the TF)	October 2017	T/3.5: AP138/17 (CNS) 10 Oct. 2017 COMPLETED	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/27 A & B	Proposal for Amendment of the Asia/Pacific Air Navigation Plan, Volume I and Volume II, Part V – MET	That, the proposed amendments at Appendix A to the Report on Agenda Item 3.5 concerning requirements for services and facilities contained in Volume I, Table MET I-1 (State Volcano Observatories) and Volume II, Table MET II-2 (Aerodrome Meteorological Offices), are endorsed and circulated to States in a Proposal for Amendment of the Asia/Pacific Air Navigation Plan, Volume I and Volume II.	ICAO APAC	State Letter (Circulation of Proposal for Amendment of the ANP Vol. I & II)	October 2017	AN 3/3 – AP005/18 (CNS/MET/AIM) 30 Jan. 2018 MET: Volume II is done, Volume I is in progress 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	IN PROGRESS	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/29 A & B	Removal of AN deficiencies AP-MET-03 and AP-MET-06 from the APANPIRG Open List	That, the AN Deficiencies AP-MET-03 and AP-MET-06 be removed from the APANPIRG Open List.	ICAO APAC	State Letter	November 2017	COMPLETED As reported in the Final Report of APANPIRG/28 (Appendix D to the Report on Agenda Item 4), the AN deficiencies AP-MET-03 and AP-MET-06 were “removed from the open list in accordance with APANPIRG/28 CONCLUSIO N 28/29”	

APANPIRG/29
Appendix A to the Report on Agenda Item 1B

Updated Status on APANPIRG/28 Conclusions/Decisions

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target date	Status as of 2 August 2018	Action by ANC
C 28/30 A & B	SIGMET coordination in the APAC Region	That, States and Administrations are encouraged to: a) Participate in cross-FIR-boundary SIGMET coordination on a bilateral or multilateral basis for seamless hazardous weather information for the benefit of aviation users, as well as advancing the capabilities of participating MWOs in the issuance of SIGMETs for cross-border hazardous weather phenomena; and b) Continue to share outcomes from SIGMET coordination activities and consider a step-by-step integration of SIGMET coordination activities in the region when operationally ready.	ICAO APAC APAC States	State Letter with Implementation on GM Action in accordance with the Conclusion	October 2017 Not specified	Follow-up action is integrated into the MET SG work plan COMPLETED	
C 28/31 A & B	Update of information in APANPIRG Air Navigation Deficiencies Reporting Form	That, States/Administrations be urged to establish: a) 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/SAR/AIM, AOP, CNS and MET fields as detailed in Appendices A, B, C & D to the Report on Agenda Item 4 ; and b) a Focal Point to coordinate actions to resolve the Deficiencies.	ICAO APAC APAC States	State Letter with Implementation on GM Action in accordance with the Conclusion	October 2017 Before the respective Sub Group Meeting in 2018.	SL AN 3/3 – AP137/17 (AGA) dated 6 October 2017 Ref.: T 11/2.1 – AP-AGA0012/18 dated 16 April 2018 COMPLETED	

— END —

INTERNATIONAL CIVIL AVIATION ORGANIZATION



**ASIA PACIFIC REGIONAL GUIDANCE ON REQUIREMENTS
FOR THE DESIGN AND OPERATIONS OF
WATER AERODROMES FOR SEAPLANE OPERATIONS**

This Guidance Material is approved by the meeting and published by
ICAO Asia and Pacific Office, Bangkok

RECORD OF AMENDMENTS AND CORRIGENDA

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TABLE OF CONTENTS

	<i>Page</i>
INTRODUCTION	iv
PART I GENERAL	1
1.1 Definitions	1
1.2 Certification of water aerodromes	2
PART II WATER AERODROME DATA	3
2.1 Water aerodrome data quality requirements	3
2.2 Geographic data	3
2.3 Water aerodrome dimensions and related information	4
2.4 Provision of operational information	5
PART III PHYSICAL CHARACTERISTICS	6
3.1 Water runway	6
3.2 Turning basins	6
3.3 Taxi channels	6
3.4 Mooring areas	7
3.5 Shore facilities	7
PART IV OBSTACLE RESTRICTION AND REMOVAL	9
4.1 Obstacle limitation surfaces	9
4.2 Displaced threshold	11
4.3 Objects and obstacles	11
4.4 Other objects	11
PART V VISUAL AIDS FOR NAVIGATION	12
5.1 Wind direction indicator	12
5.2 Markings	12
5.3 Signs	13
5.4 Strobe Lights	14
PART VI VISUAL AIDS FOR DENOTING OBSTACLES	15
6.1 Objects to be marked and/or lighted	15
6.2 Marking of objects	15
PART VII WILDLIFE STRIKE HAZARD REDUCTION.....	16
PART VIII LIGHTING OF MOVEMENT AREA	17
PART IX RESCUE AND FIRE FIGHTING.....	18
PART X WATER AERODROME EMERGENCY PLANNING	19

APPENDIX 1 — Figure 1 – Obstacle Limitation Surface.....	20
APPENDIX 1 — Figure 2 – Curved Take-Off Climb/Approach Surface	21
APPENDIX 2 — REFERENCES	22

Asia Pacific Regional Guidance on Requirements for the Design and Operations of Water Aerodromes for Seaplane Operations

INTRODUCTION

ICAO Annex 14 does not differentiate between land and water as a surface from which aircraft can operate; and Annex 14 defines that an aerodrome can be an area of land or water.

Operations of aeroplanes on water differ significantly from those conducted on land, and the criteria used for certification of land aerodromes may not be appropriate for certification of water aerodromes. However, one fundamental certification criterion that requires the aerodrome certificate holder to establish and maintain an appropriate Safety Management System (SMS) remains the same for both land and water aerodromes.

The specifications outlined in this document focus on those facilities, services and equipment where water aerodromes differ from land aerodromes in terms of their design and operations.

PART I GENERAL

Note. – This guidance material outlines the minimum specifications for the physical characteristics, obstacle limitation surfaces (OLS), visual aids, services and operating procedures to be provided at water aerodrome for seaplanes operating maximum mass of 5700Kg and below.

1.1 Definitions

Aerodrome – A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and movement of aircraft.

Aeroplane – A power-driven heavier than air aircraft deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Fixed platform – A platform extending from the shore, on water and supported by pillars to hold it in position, intended to align alongside seaplanes for the purposes of embarkation and disembarkation of passengers, loading and unloading of cargo, or refueling or parking of seaplanes.

Floating platform – A platform placed on open water authorized for the purpose of embarkation and disembarkation of passengers, loading and unloading of cargo by seaplane.

Gangway – A movable walkway where people board and disembark such as platforms, and piers.

Low water level – The average low level during that month of the year when levels are lowest or, in the case of tidal waters, the average level of low water springs or lower low waters, depending on the type of tide.

Mooring – A fixed permanent installation on the water surface used to secure seaplanes. The seaplane may be moored to a floating buoy, a pier, platforms, etc.

Mooring buoy – A buoy connected by chain or cable to a permanent unmovable anchor sunk deeply into the bottom of a body of water.

Protected area – An area which is protected from large waves. The structure providing protection can be natural or constructed.

Seaplane – An aeroplane on floats (amphibious or non-amphibious) or a flying boat (water-only or amphibious).

Taxi channel – A defined path on a water aerodrome, intended for the use of taxiing seaplanes.

Turning basin – A water area used for the water taxi maneuvering of seaplanes along shoreline facilities and at the ends of a narrow water runway.

Waterways – A river, canal or other waterbody serving as a route or way of travel or transport.

Water aerodrome – A defined area, primarily on water, intended to be used either wholly or in part for the arrival, departure and movement of seaplanes, and any building and equipment on ground or water.

Water aerodrome movement area – The part of an aerodrome to be used for take-off, landing and taxiing of seaplanes, consisting of the maneuvering area and platforms.

Water aerodrome operator – Any organization/ or person in charge of a water aerodrome including employee, agent or other authorized representative.

Water current – is rate of flow of the water.

Water runway (channel) – A defined rectangular area on a water aerodrome, intended for the landing and take-off of seaplane along its length.

1.2 Certification of water aerodromes

1.2.1 States should certify water aerodromes open to public use in accordance with these specifications as well as other relevant ICAO specifications through an appropriate regulatory framework.

1.2.2 The regulatory framework shall include the establishment of criteria and procedures for the certification of water aerodromes.

Note 1.— Guidance on a regulatory framework which is given in the Manual on Certification of Aerodromes (Doc 9774) may be used as far as appropriate for the certification of water aerodromes.

Note 2.— The Sample APAC Regulations for Water Aerodromes, First Edition 2015 provides general guidance to the State Administration for establishing national regulations for water aerodromes.

1.2.3 As part of the certification process, States shall ensure that a water aerodrome manual which will include all pertinent information on the water aerodrome site, facilities, services, equipment, operating procedures, organization and management including a safety management system, is submitted by the applicant for approval/acceptance prior to granting the aerodrome certificate.

Note 1.— The intent of a safety management system is to have in place an organized and orderly approach in the management of aerodrome safety by the aerodrome operator. Annex 19 — Safety Management contains the safety management provisions applicable to certified aerodromes. Guidance on a harmonized safety management system is given in the Safety Management Manual (SMM) (Doc 9859) and in the Manual on Certification of Aerodromes (Doc 9774). Procedures on the management of change, conduct of safety assessment, reporting and analyses of safety occurrences at aerodromes and continuous monitoring to enforce compliance with applicable specifications so that identified risks are mitigated can be found in the PANS-Aerodromes (Doc 9981).

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PART II WATER AERODROME DATA

*Note.— This Part contains specifications for the provision of data relating to the water aerodrome that is to be determined and recorded in the **Water Aerodrome Operations Manual (WAOM)**. This Part is also used to define the characteristics of water aerodrome that are to be made available through the aeronautical information publications and/or disseminated through an aeronautical information service.*

2.1 Water aerodrome data quality requirements

2.1.1 Except as specified, the determination and reporting of water aerodrome-related aeronautical data shall be in accordance with the accuracy requirements set forth below taking into account the established quality system procedures:

- a) The water aerodrome elevation shall be measured to the accuracy and rounded up to the next higher of one half metre or foot;
- b) Linear dimensions shall be measured to the nearest one-half metre;
- c) Aeronautical geographical co-ordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 reference datum;
- d) True bearings shall be measured to the nearest degree;
- e) Water depths shall be measured and rounded down to the nearest one tenth of metre; and
- f) Tides shall be measured with respect to lowest tides recorded for the location.

2.2 Geographic data

Geometric centre

2.2.1 The geometric centre of a water aerodrome shall be determined and given to the nearest 1/10th second.

Water aerodrome elevation

2.2.2 Average highest elevation of the water runway shall be measured with reference to mean sea level.

Water aerodrome magnetic variation

2.2.3 The magnetic variation for the water aerodrome geometric centre shall be determined and given to the nearest degree from magnetic north.

Navigation aids

2.2.4 Where navigation aids are installed for use at water aerodromes, the following information shall be determined and given:

- (a) the bearing, geographic co-ordinates of the antenna or radiating centre to the nearest 1/10th second; and
- (b) the elevation of the antenna or radiating centre.

2.3 Water aerodrome dimensions and related information

2.3.1 The following data shall be measured or described and given for each facility provided on a water aerodrome:

- a) water runway(s):
 - (i) true bearing;
 - (ii) length;
 - (iii) width;
 - (iv) depth of water; and
 - (v) water current.
- b) turning basins:
 - (i) location;
 - (ii) dimension; and
 - (iii) depth of water.
- c) taxi channel:
 - (i) width; and
 - (ii) depth of water.
- d) shore facility:
 - (i) type; and
 - (ii) depth at shore.
- e) significant obstacles on and in the vicinity of the water aerodrome:
 - (i) location;
 - (ii) top elevation to the nearest (next higher) foot; and
 - (iii) type.
- f) marking
 - (i) water runways;
 - (ii) taxi channels; and
 - (iii) hazardous areas.

2.4 Provision of operational information

Movement area and related facilities

- 2.4.1 Information on the condition of the movement area and the operational status of related facilities shall be given to the appropriate aeronautical information service;
- a) Information of operational significance shall be given to the appropriate air traffic services units; and
 - b) The information shall be kept up to date.
- 2.4.2 The condition of the movement area and the operational status of related facilities shall be monitored and reports of operational significance or affecting seaplane performance shall be given to the appropriate air traffic services units in respect of:
- a) damage to shore facility;
 - b) floating debris in the movement area;
 - c) temporary hazards to include log booms, surface vessels or any other surface or below surface hazard;
 - d) abnormally high/low water depth;
 - e) water currents;
 - f) tidal areas, depth of water at high and low tides or seasonal changes; and
 - g) any other information that may have safety impact on operations.
- 2.4.3 Information on water runway(s) shall consist of:
- a) the tidal range;
 - b) the times of high and low tide; and
 - c) the approximate speed and direction of the water current.

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PART III PHYSICAL CHARACTERISTICS

3.1 Water runway

Number and orientation of water runways

3.1.1 The number of water runways at a water aerodrome and their orientation should be such that, for a large percentage of time as practicable but for not less than 95 percent there is at least one water runway for which the surface wind velocity component at right angles to its longitudinal axis will not preclude the landing or taking off of seaplane that the water aerodrome is intended to serve.

Length of water runways

3.1.2 The length of the water runway to be provided should be adequate to meet the operational requirements of the critical seaplane for which the runway is intended and should be not less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant seaplanes.

Width of water runways

3.1.3 The width of the water runway should be not less than 60 m wherever practicable.

Water Depth

3.1.4 The depth of the water measured at low water level in the water runway should not be less than 1.8 m (6 ft.) or less than 0.3 m below the hull or floats when the seaplane is stationary and loaded to maximum takeoff weight.

Water runway strip

3.1.5 A protective buffer should extend on each side from the edge of the water runway to a distance of not less than 30 m (100 ft.) and on each end of the water runway to a distance of 60 m wherever practicable.

3.2 Turning basins

3.2.1 Turning basins should be provided at the end of the water runway, whenever necessary.

3.2.2 When turning basins are provided it shall have:

- (a) A diameter measured at low water level of not less than twice the specified minimum width of the corresponding water runway;
- (b) The depth of turning basins measured at low water level should be at least that of the corresponding water runway; and
- (c) A horizontal obstruction clearance between the edge of the turning basin and the nearest obstacle of no less than 15 m (50 ft.).

3.3 Taxi channels

3.3.1 Taxi channels should be provided to permit the safe and expeditious handling of aerodrome traffic. Where provided, the taxi channels shall have a width of not less than 45 m (150 ft.), wherever practicable

3.3.2 Wingtip to wingtip clearance for passing seaplanes (dual directional taxi channels) should be not less than 15 m (50 ft.).

3.3.3 The depth of the water measured at low water level in the taxi channel should not be less than 1.8 m (6 ft.) or less than 0.3 m below the hull or floats when the seaplane is stationary and loaded to maximum take-off weight.

3.4 Mooring areas

3.4.1 Mooring areas should be provided, whenever necessary, for the mooring of seaplane and to permit the embarkation and disembarkation of passengers, loading and unloading of cargo and mail without interfering with the aerodrome traffic.

3.4.2 When mooring areas are provided:

- (a) The size of the mooring areas should be adequate to permit expeditious handling of the peak hour traffic.
- (b) The depth of water at the mooring area measured at low water level should be at least that of the corresponding taxi channel.
- (c) The mooring area shall be designed in such a manner as to provide a minimum clearance of 15 m (50 ft.) between any part of the seaplane and any object it could come into contact with depending on water level.

3.5 Shore facilities

3.5.1 A platform (fixed or floating), ramp or beach should be provided to permit the embarking and disembarking of passengers and crew, loading and unloading of cargo and refueling.

3.5.2 Where a platform is provided it shall:

- a) be in a condition that permits constant use without causing injury to persons or damage to aircraft;
- b) be attached or anchored in a manner that prevents it from shifting position or becoming detached;
- c) have access from the shore that provides for the safe movement of crew and passengers; and
- d) have at least two bull rails or provision for appropriate number of tie-down cleats at each seaplane parking position to secure the seaplane.

3.5.3 When a seaplane is normally secured in a position where any seaplane component overhangs the platform and constitutes a hazard to the movement of crew and passengers, the hazard shall be clearly indicated by means of:

- a) cones; and/ or
- b) hashed red and white markings; and
- c) in a manner easily identifiable to crew and passengers.

3.5.4 Where a ramp or beach is provided it shall be:

- a) built 1.5 times the width of floats or landing gear of the largest seaplane intended to use the facility;
- b) located in such a manner as to provide a minimum clearance of 1.8 m (6 ft.) between a seaplane wing and any object it could come into contact with; and
- c) constructed with a slope not steeper than 8:1.

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PART IV OBSTACLE RESTRICTION AND REMOVAL

Note.— This Part establishes a series of Obstacle Limitation Surfaces (OLS) that define the limits to which objects may project into the airspace in order to minimize the dangers presented by obstacles, either during take-off or approach of seaplanes at water aerodromes.

4.1 Obstacle limitation surfaces

4.1.1 The following OLS shall be established for non-instrument water aerodromes as shown in Figure 1 provided in Appendix 1:

- a) a take-off climb/approach surface;
- b) a transitional surface; and
- c) an inner horizontal surface.

Take-off climb /approach Surface

4.1.2 *Description* – The take-off climb/approach surface shall be either straight or curved and established at the end/beginning of the water runway strip.

4.1.3 *Characteristics* – The limit of the take-off climb /approach surface shall be:

- a) The width of the inner edge shall not be less than that of the associated water runway strip
- b) The inner edge shall start at 60 m from threshold of water runway;
- c) The elevation of the inner edge shall be the elevation of the water aerodrome;
- d) The length of the take-off climb /approach surface shall not be less than 2500 m (8200 ft.) from the inner edge;
- e) The slope of the take-off climb/approach surface shall be a minimum of 4 % (1:25);
- f) The centre line of the take-off climb/approach surface shall define the approach path and be:
 - (i) a straight line; or
 - (ii) an arc of constant radius; or
 - (iii) a combination of a straight line and an arc of constant radius.

Straight-in take-off climb/Approach Surface

4.1.4 Where the slope is designed for a straight-in approach the divergence of the take-off climb/approach surface shall be set at 10% starting from the inner edge.

Curved take-off climb/approach Surfaces

4.1.5 Where established, a curved take-off climb/approach surface shall not contain more than one curved portion.

4.1.6 A curved portion of a take-off climb/approach surface shall not allow a change of direction greater than 90 degrees.

4.1.7 Where a curved portion of take-off climb/approach surface is provided:

- a) the straight portion originating at the inner edge shall not be less than 1300 m (4265 ft.); and
- b) the radius of arc defining the centre line of the take-off climb/approach surface shall not in any portion of the take-off climb/approach surface be less than 736 m (2415 ft.) in accordance with **Figure 2** given in **Appendix 1**.

4.1.8 A take-off climb/approach surface incorporating a curved portion shall be established only where guidance, such as, geographical points or other visual references are available.

Note.— A curved approach is normally established at a non-instrument water runway where it is necessary to avoid obstacles, terrain, noise sensitive areas, or to utilise the airspace above public lands (e.g. freeways, rivers, golf courses).

Table 1 - Dimensions and slopes of obstacle limitation surfaces - water aerodromes

Approach type – Non-instrument	
Take-off climb/approach surface	
Width of inner edge	Width of water runway strip - (120 m minimum)
Location of inner edge	60 m from the threshold
Divergence take-off climb/approach surface	10 %
Length (minimum)	2500 m
Slope of take-off climb/approach surface (maximum)	4% (1:25)
Transitional Surface:	
Slope (maximum)	Vertical to 15 m then 1:5 (20 %)
Inner Horizontal Surface:	
Height	45 m
Radius	2,500 m

4.2 Displaced threshold

4.2.1 Where the integrity of the approach surface cannot be maintained due to fixed or mobile obstacles, a landing threshold shall be displaced from the normal threshold.

4.2.2 This displacement shall be established so that the new approach surface, starting at the displacement, will clear all obstacles.

4.2.3 Where a threshold has been displaced, the inner edge of approach surface shall be located at 60 m from the point of displacement.

4.3 Objects and obstacles

4.3.1 No fixed object shall be permitted on a water runway or on a water runway strip.

4.3.2 Fixed objects or structures that are located within the water aerodrome boundary shall not penetrate OLS unless:

- a) those structures are for air navigation purposes; or
- b) are essential to the safety of aircraft operation;
- c) are marked, in accordance with ICAO Annex 14, Volume I; and
- d) are frangible.

4.3.3 A mobile object shall not penetrate take-off climb/approach surfaces, unless procedures are in place to ensure the object is removed during approach and departure operations.

4.4 Other objects

4.4.1 Where an aeronautical study (safety risk assessment) indicates that an object is hazardous to seaplane located on the movement area or in the air in the immediate vicinity of the water aerodrome, it shall be:

- a) removed; or
- b) marked; and/or
- c) lighted in accordance with ICAO Annex 14, Volume I.

4.4.2 The water aerodrome operator shall conduct a safety risk assessment to establish the required clearances to be used above waterways, lagoons, or harbor.

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PART V VISUAL AIDS FOR NAVIGATION

5.1 Wind direction indicator

- 5.1.1 Unless the direction of the wind can be obtained by radio, at least one wind direction indicator should be installed.
- 5.1.2 Where a wind direction indicator is installed it shall be:
- a) of an international orange, orange and white or red and white colour; and
 - b) in the form of a truncated cone.
- 5.1.3 The wind direction indicator should be:
- a) visible at a height of 300 m (1000 ft.) above the water runway; and
 - b) visible from any portion of the manoeuvring area.

5.2 Markings

5.2.1 Dock identification marking

Characteristics

5.2.1.1 Dock identification markings shall consist of:

- a) a triangle;
- b) painted bull rails as specified in 5.2.1.3.

5.2.1.2 Both markings shall be affixed to the upper surface of the dock so as to be visible from 300 m (1000 ft.) above the water runway.

Bull rails

5.2.1.3 Where bull rails are installed they shall be painted in alternated bands of international orange and white stripes.

Gangways

5.2.1.4 Gangways shall be painted red or signage provided indicating seaplane access only.

5.2.2 Marker buoys

Characteristics

5.2.2.1 Marker buoys shall be visible to aircraft:

- a) manoeuvring on the surface of water; and
- b) 300 m (1000 ft.) above the water runway.

Water runway markers

5.2.2.2 Except as specified in 6.2.2.3 at water aerodromes where there is no conflict with marine traffic or marine regulations:

- a) Both ends of the take-off and landing area shall be marked with floating markers.
- b) The markers shall be visible from a distance greater than 2 nautical miles.
- c) Each marker shall be:
 - of international orange in color; or
 - alternating international orange and white.

5.2.2.3 Where it is impracticable to mark the water runway as specified in 5.2.2.2:

- (a) guidance such as geographical points and/or other visual references shall be provided to designate the take-off and landing area; and
- (b) these visual references shall be identified and published.

Displaced threshold markers

5.2.2.4 Where a threshold is displaced permanently or temporarily:

- a) the threshold displacement shall be marked with floating markers;
- b) the markers shall be visible from a distance of at least 2 nautical miles; and
- c) each marker shall be international orange or the markers shall be alternating international orange and white.

Hazardous areas markers

5.2.2.5 Where shoals or other hazards could endanger a seaplane, marker buoys shall be installed to clearly indicate the hazardous area.

5.2.2.6 Marker buoys for delineating hazardous area shall be distinctly marked from water runway markers in colour and shapes.

5.3 Signs

Prohibition signs

5.3.1 A sign shall be provided and displayed on the dock restricting the dock to seaplane operations only.

5.3.2 A sign shall be displayed on the dock restricting passengers from the docking area until all seaplanes and propellers have come to a complete stop.

5.4 Strobe Lights

5.4.1 Strobe lights should be installed to delineate water aerodrome facilities wherever necessary. Where installed, the strobe lights shall be:

- a) white, quick flashing; and
- b) located in an area that is easily and constantly seen by both marine and air traffic.

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PART VI VISUAL AIDS FOR DENOTING OBSTACLES

6.1 Objects to be marked and/or lighted

Fixed objects

- 6.1.1 Objects that are conspicuous by their shape, size or colour need not be marked.
- 6.1.2 Except as covered under the Marine Act, objects shall be marked in accordance with 6.2.

6.2 Marking of objects

General

- 6.2.1 Except as specified in 6.1.1 all fixed objects shall be marked in a conspicuous colour.
- 6.2.2 Where it is not possible to colour the objects, markers or flags shall be displayed on or above the objects.

Use of colours

- 6.2.3 The colour and form of marking displayed on objects shall be in accordance with *Annex 14, Volume I- Aerodrome Design and Operations*.

Use of markers

- 6.2.4 Markers displayed on or adjacent to objects shall be:
- a) located in conspicuous positions so as to retain the general definition of the object; and
 - b) recognizable in clear weather from a distance of:
 - 1000 m for an object to be viewed from the air; and
 - 300 m for an object to be viewed from the ground in all directions in which a seaplane is likely to approach the object.
- 6.2.5 The shape of the markers shall be:
- a) distinctive to the extent necessary to ensure that they are not mistaken for markers employed to convey other information; and
 - b) such that the hazard presented by the object they mark is not increased.
- 6.2.6 The colour selected shall contrast with the background against which it will be seen.

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PART VII WILDLIFE STRIKE HAZARD REDUCTION

Note.— The presence of wildlife (birds) on and in the water aerodrome vicinity poses a serious threat to seaplane operational safety.

7.1 The wildlife strike hazard on or in the vicinity of water aerodrome shall be assessed through an ongoing evaluation of the wildlife hazard by competent personnel.

7.2 Action shall be taken to decrease the risk to seaplane operations by adopting measures to minimize the likelihood of collisions between wildlife and seaplane.

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PART VIII LIGHTING OF MOVEMENT AREA

8.1 Water aerodrome identification and maneuvering area lighting should be provided for reduced visibility conditions wherever necessary.

8.2 A lighted water aerodrome can be identified by a beacon alternating white and yellow flashes at the rate of 12 to 30 flashes per minute.

8.3 In water traffic congested areas, a radio activated strobe beacon may be used to alert mariners and other airman that a seaplane will be arriving or departing within a short time.

8.4 Floodlights or spotlights should be installed on the shore to illuminate aprons, floats, ramps, and piers wherever necessary. Care must be taken in locating and aiming floodlights to preclude affecting the vision of pilot's landing or taking off or creating distracting reflections.

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PART IX RESCUE AND FIRE FIGHTING

Level of protection to be provided

9.1 At water aerodromes the rescue and fire-fighting vessel(s) shall be provided appropriate to the level of protection required.

9.2 The rescue vessel(s) provided shall be appropriate for the environment involved and they shall be capable or shall carry equipment capable of accommodating twice the maximum number of passengers carried by the largest type of seaplane serving the water aerodrome.

9.3 The level of protection provided at a water aerodrome for rescue and fire-fighting shall be appropriate to the water aerodrome using principles in paragraphs 9.2.4 and 9.2.5 of ICAO Annex 14 Volume I.

9.4 Types of extinguishing agents and the amount of water for foam production and complimentary agents shall be provided on the rescue and fire-fighting vessel(s) in accordance with the aerodrome category for rescue and fire-fighting determined under Table 9-1 and Table 9-2 of ICAO Annex 14 Volume I.

9.5 The equipment and information sufficient to navigate to and from the incident site, communicate with survivors and rescue personnel, effect entry and fire-fighting and provide medical assistance shall be provided in rescue and fire-fighting vessels.

9.6 A communication system shall be provided linking the water aerodrome fire station, control tower (if available), fire and rescue vessel(s), fire and rescue vehicles and any other fire station (if available) in the vicinity.

9.7 An alerting system for rescue and fire-fighting personnel, capable of being operated by that station, shall be provided at a fire station, any other fire station in the vicinity and the aerodrome control tower.

Response time

9.8 For water aerodromes the operational objective of the RFFS shall be to achieve a response time not exceeding three (03) minutes to any point of each operational water runway, in optimum visibility and surface conditions.

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PART X WATER AERODROME EMERGENCY PLANNING

10.1 The operator of water aerodrome shall prepare and submit an Aerodrome Emergency Plan (AEP) for the particular water aerodrome for approval/acceptance by the regulatory authority.

10.2 The objectives of emergency planning outlined in Chapter 9 of ICAO Annex 14, Volume I applies equally to water aerodromes.

10.3 The emergency plan shall consider the particular hazards associated with seaplane operations, including:

- a) passenger evacuation into a further life-threatening environment, e.g. deep water;
- b) the onset of hypothermia, and its associated effects, during and following prolonged immersion in cold water; and
- c) the immediate toxicity and respiratory effects on survivors in the water following the ingestion of floating fuel and oils and their associated vapours, and fire suppressant foams, powders and gases.

10.4 The AEP shall contain provisions for:

- a) water rescue;
- b) fire response; and
- c) recovery of disabled aircraft from the movement area.

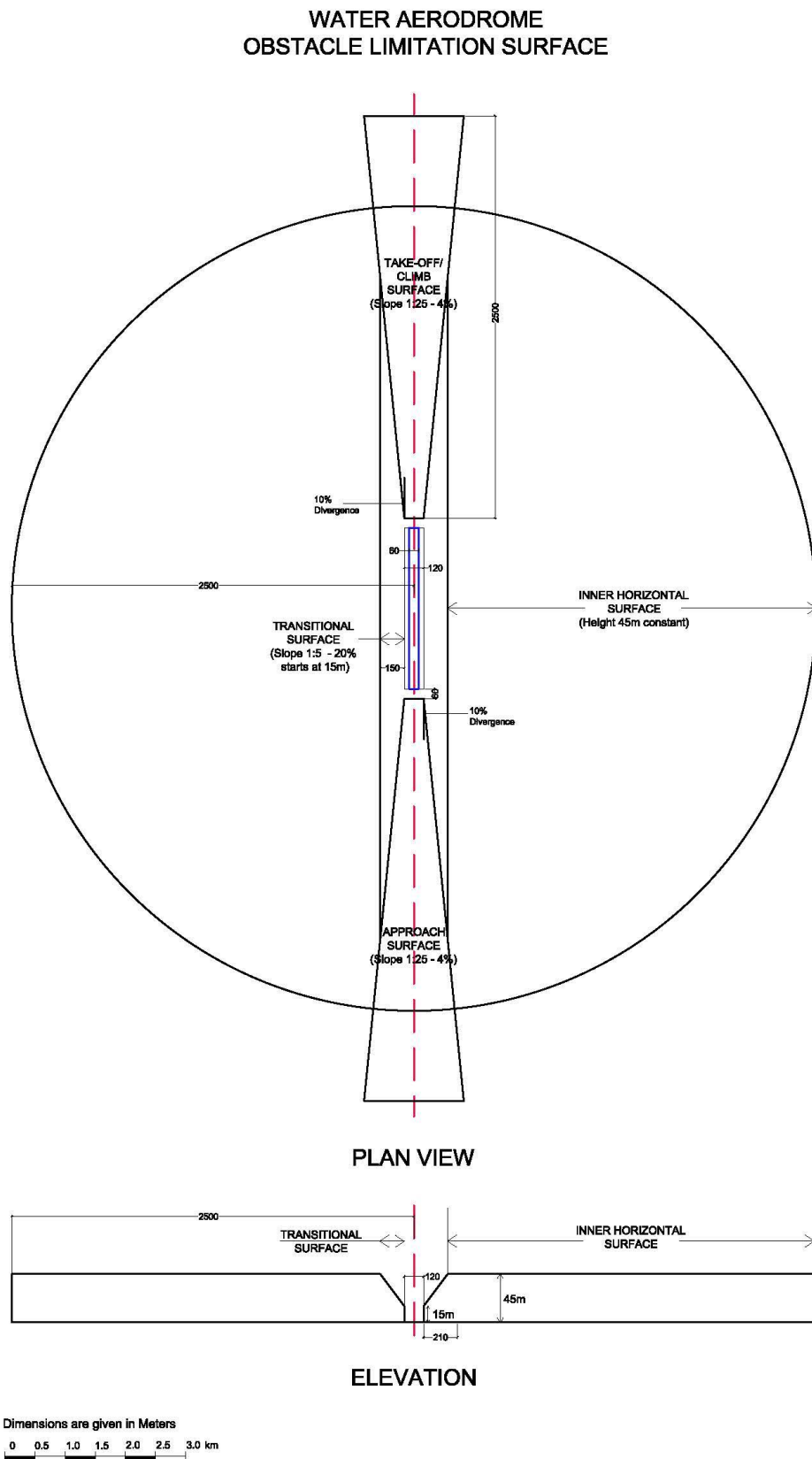
10.5 The AEP shall contain procedures for periodic testing of the adequacy of the plan and for reviewing the results in order to improve its effectiveness.

10.6 The AEP shall be tested in accordance with the Annex 14, Volume I requirements.

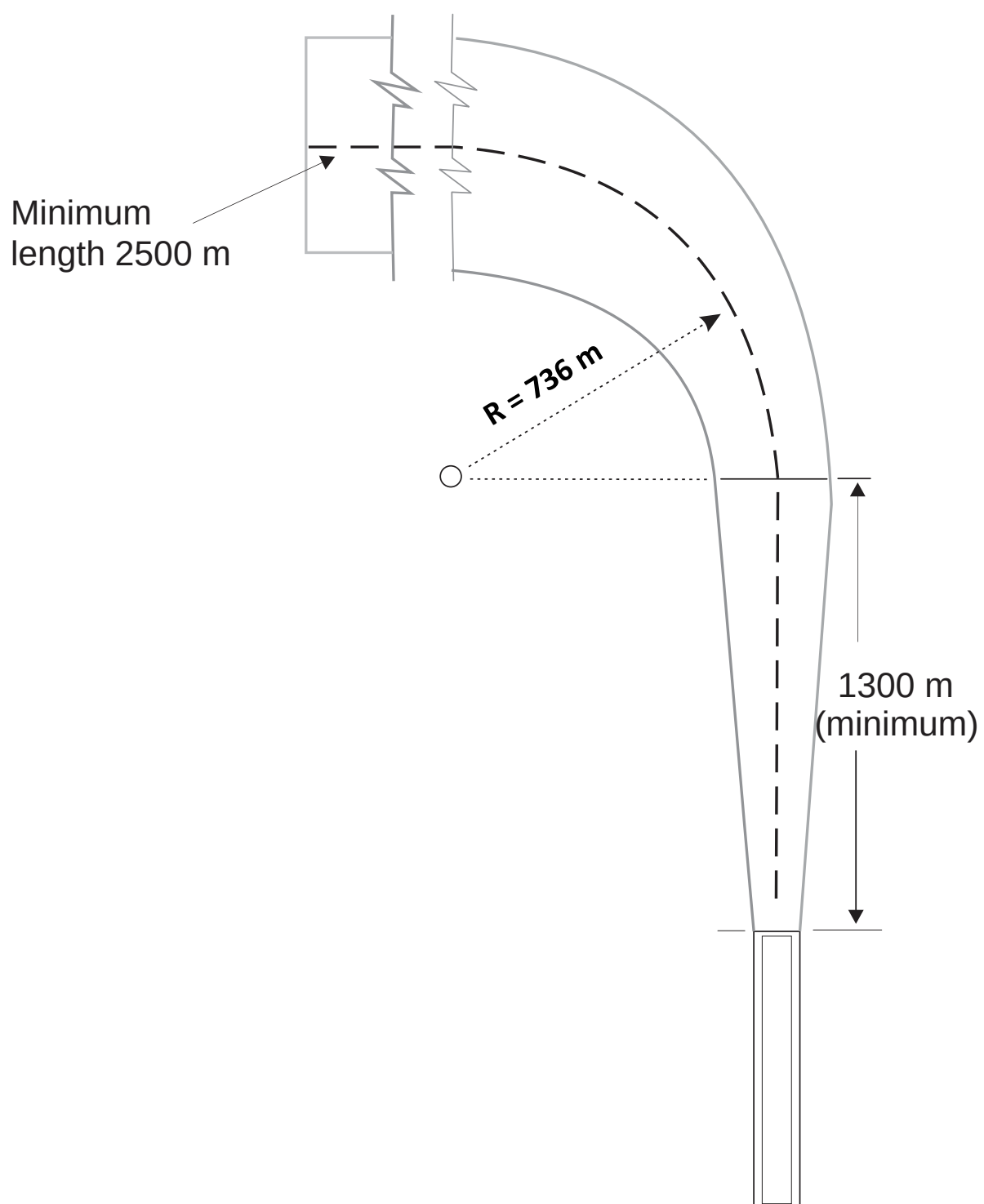
Note.— Additional guidance on seaplane accidents in the water is outlined in Appendix 6 to the ICAO Airport Services Manual (Doc 9137) Part 7.

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APPENDIX 1 — Figure 1 – Obstacle Limitation Surface



APPENDIX 1 — Figure 2 – Curved Take-Off Climb/Approach Surface



APPENDIX 2 — REFERENCES

REFERENCES

- 1) Annex 14 — Aerodromes, Volume I — Aerodrome Design and Operations
- 2) Air Safety Support International, Overseas Territories Aviation Requirements, Part 139 – Certification of Aerodromes, Subpart F – Water aerodromes
- 3) FAA Advisory Circular, AC No. 150/5395-1B – Seaplane Bases
- 4) Supplementary Information Relating to the Report on Requirements for a Safety Case pertaining to Air and Water Operations in Victoria Harbour, QualaTech Aero Consulting Ltd., 20 September 2010.

—END—

APANPIRG/29
Appendix B to the Report on Agenda Item 3.1

DRAFT PROVISIONAL AGENDA FOR AOP/SG/3 IN 2019

Agenda Item 1:	Adoption of Provisional Agenda
Agenda Item 2:	Review Outcome of Relevant Meetings
Agenda Item 3:	Regional Reporting – Asia Pacific ANP – Asia Pacific Seamless ATM Plan
Agenda Item 4:	Provision of AOP in the Asia/Pacific Region – Regulation of Aerodromes – Aerodrome Planning & Design – Management, Operations and Maintenance of Aerodromes – Airport Collaborative Decision Making (A-CDM) – Trainings
Agenda Item 5:	AOP Air Navigation Service Deficiencies
Agenda Item 6:	Update of the AOP/SG Task List
Agenda Item 7:	Airport Environmental Initiatives
Agenda Item 8:	Any other business
Agenda Item 9:	Date and Venue for Next Meeting

ASIA/PACIFIC PLANNING CHECKLIST FOR BALLISTIC LAUNCH AND SPACE RE-ENTRY

A.1 Launch Facilities:

- Generally ballistic launches take place from pre-defined locations. This should enable analysis and pre planning of contingency options that can be activated when a launch is notified
- Launch locations (whether mobile or static) should be positioned to away from busy air traffic areas.

A.2 Pre Launch Planning:

- Launch details should be published at least **two working weeks'** notice; if possible, and include
 - Extent and coordinates of proposed danger Zone
 - Ensure planning and notification is in place for any re-entry/debris possibility
 - Tentative launch window (timing and dates)

To all affected FIRs and respective ICAO regional office.

- Ideally the Launch State should have at least one conference call with affected FIR operational management to:
 - discuss impact and options for alternative dates/times that minimise operational impact
 - identify contingency routing if possible
 - coordinate NOTAM action
 - Discuss any possible re-entry issues and impact
 - Liaison with affected airspace Users
 - Notify and agree process for actual activation and cancellation of any restrictions

A.3 Tactical Launch Co-ordination process:

- Actual Launch "Window" published with ideally **three days' notice**; but not less than 24hrs
- Launch State to ensure ongoing collaborative information sharing with points of contact in affected FIRs:
 - Real Activation Time Window: As the countdown begins / at least four hours prior;
 - Facilitating launch with minimal impact on civil air traffic: Launch authorities to clearly convey estimated normalcy time e.g. flights beyond XX:XX (time in UTC) can expect normal routings, but can be advised to carry fuel for the alternate routings (to be on safer side),
 - Notify Lift off: As soon as the Rocket gets airborne and
 - Notify End of activity through NOTAMC: coordinate and ensure immediate withdrawal of NOTAMs by all affected FIRs

A.4 Launch Cancellations:

- Cancellations of launch at any point of time needs to be disseminated as soon as possible to all affected FIRs.
- Ongoing information sharing should take place until the 'all clear' is given.

ROCKET LAUNCH/SPACE RE-ENTRY ACTIVITY MANAGEMENT

PLANNING CHECK LIST

- Launch required by:
- Proposed Temporary Danger Area:
- Proposed launch Reservation window:
- Date: DD/MM/YYYY to DD/MM/YYYY Time: XX:XX to YY:YY UTC
- Proposed Definitive launch window:
- Date: DD/MM/YYYY to DD/MM/YYYY Time: XX:XX to YY:YY UTC
- Expected exact date of launch: DD/MM/YYYY

<i>Affected FIR</i>	<i>Affected AWYs</i>	<i>Affected Flights in requested Time window</i>	<i>Option 1: Suggested revised time and date</i>	<i>Option 1: Affected flights in revised time and date</i>	<i>Option 2: Suggested revised time and date</i>	<i>Option 2: Affected flights in revised time and date</i>

Pre-Launch Conference Call agenda:

- Notify latest Launch details and logistics
- Identify contingency routing:
- Identify SUA, FUA options to improve ATM during launch:
- Coordinate NOTAM action among all affected FIRs:
- Discuss any possible re-entry issues and impact:
- Notify process for actual activation and cancellation of any restrictions:
(AFTN/NOTAM/NOTAMC/email, Telephone Call),
- Any other business

Identify Points of Contact (POC) for airspace reservation co-ordination,

Affected FIR	POC (Name, Designation)	Tel , Mob, AFTN	Email

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ATM/SG/6 - Flimsy 6: International Airspace and Civil/Military Cooperation

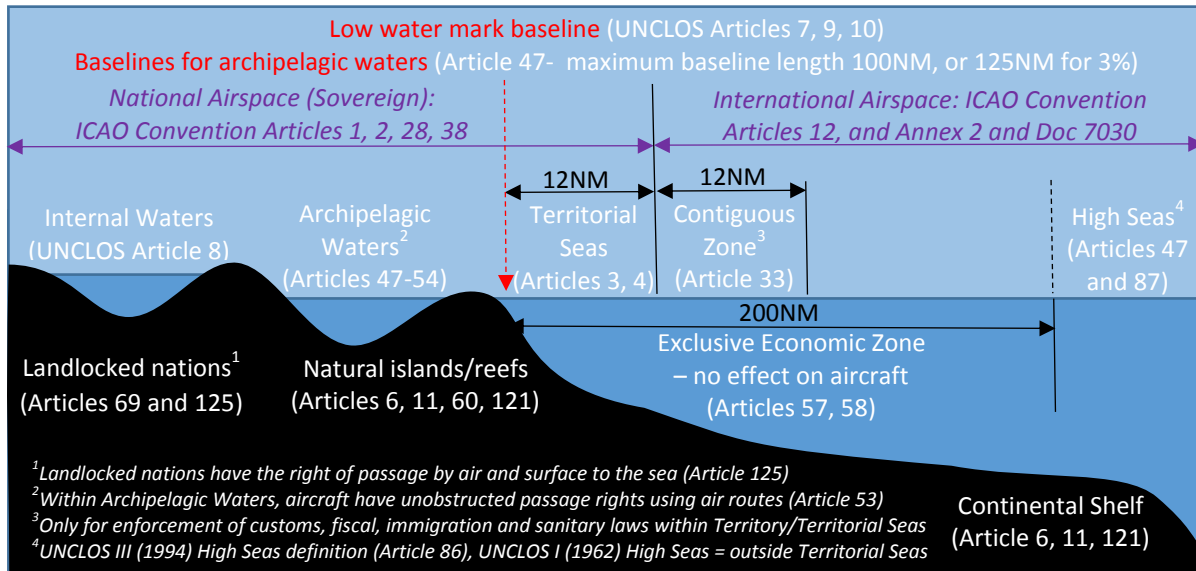


Figure 1: Maritime and Airspace Volumes as Defined by UNCLOS (white/red = UNCLOS, purple = CC)

Key aspects about the *United Nations Convention on the Law of the Sea* (UNCLOS) and the *Convention on International Civil Aviation* ('Chicago Convention' or 'CC') are as follows.

- Although UNCLOS is titled as a 'Law of the Sea', its provisions also affect airspace and the operation of aircraft!
- In particular, UNCLOS defines volumes of airspace that are sovereign and international (where States may make laws and where States may not make universal laws* respectively, **Figure 1**). It should be noted that the terms 'national airspace' and 'international airspace' are descriptive in nature, but do not appear in UNCLOS or the CC.
**Note: notwithstanding this, States may enact laws for their own citizens and aircraft registered in those States for operations within international airspace.*
- The volumes of airspace are dependent on the definition of 'baselines' in UNCLOS, which are generally based on the maritime shoreline, whether the shore is continental in nature or the outermost part of a chain of islands (an archipelago). However, not all island groups are archipelagos, as the islands must be no more than 100NM apart to meet the definition of being an archipelago (except for 3%, 125NM apart).
- Archipelagic Waters and the airspace above them are sovereign and part of the territory of the State concerned, which is relevant for Article 28 of the CC (provision of air navigation services). However, the sovereignty of archipelagic airspace is not the same as other territorial airspace, as aircraft have the right of 'continuous and expeditious' passage, so cannot be denied transit through this area (UNCLOS Article 53).
- Exclusive Economic Zones (EEZs) only have material effect on maritime resources, including the sea bed, and do not have any legal consequences for aviation (UNCLOS Articles 57 and 58).

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- The CC and Annex 2 is not considered to use the same definition of ‘High Seas’ as the 1994 iteration of UNCLOS, deferring to the earlier version (1962)*. Article 2 of the CC is clear that ‘National Airspace’ only composes the land and territorial waters; therefore, the non-sovereign portion of airspace is beyond this, as far as aviation is concerned (i.e.: beyond 12NM). In addition, not all States have ratified the latest version of the UNCLOS.
Article 2: For the purposes of this Convention the territory of a State shall be deemed to be the land areas and territorial waters thereto under the sovereignty, suzerainty, protection or mandate of such State.
 - While the CC and its Annexes, including Annex 2, are not applicable to State aircraft (military, police or customs) in general, the Convention does place requirements upon States regarding the interaction between military and civil aircraft. For example, State aircraft may not overfly the territory of another State without permission, and regulations must be enacted to require State aircraft to have ‘due regard’ for the safety of navigation of civil aircraft (Article 3 of the Convention).
 - In addition, Article 3 *bis* of the CC requires States to ensure that military aircraft do not endanger civil aircraft, but these are only for two specific situations – use of weapons and interception.
 - There are no requirements for State aircraft to comply with civil requirements in international airspace (thus a State aircraft operating on a flight plan in such airspace is complying with civil requirements voluntarily, including an ATC clearance to enter controlled airspace, and may not legally be denied an ATC clearance to transit).
 - It is possible that States may determine that, in the interests of safe interaction between military and civil aircraft, Article 3 *bis* of the CC needed to be amended to include reference to the specific requirement for an ATC clearance into controlled airspace (to ensure entry at a safe level, position and time, not for denial of transit), but ICAO had no current plans to amend the Convention in this regard, *or to further clarify what ‘international airspace’ is.

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**TERMS OF REFERENCE (TOR) of the
Advanced Inter-Regional ATS Route Development Task Force (AIRARD/TF)**

1. TERMS OF REFERENCE

1.1 The terms of reference of the AIRARD Task Force are to:

- a) identify requirements and improvements for achieving and maintaining an efficient route network across the ICAO APAC, EUR/NAT and MID Regions based on the airspace user needs and in coordination with stakeholders (States, International Organizations, user representative organizations and other ICAO Regions);
- b) ensure harmonized planning and implementation of ATS routes and airspace improvement projects at the interfaces between the three ICAO Regions;
- c) monitor the status of implementation of the agreed ATS routes and airspace improvement projects;
- d) in case of implementation problems, identify the associated difficulties and propose/agree to solutions to further progress with the implementation;
- e) review and amend the components of the ATS route structure and airspace description in order to ensure their compliance with ICAO provisions (e.g. five-letter name-code (5LNC) uniqueness, ATS route designators, WGS-84 coordinates, flexible use of airspace (FUA) implementation);
- f) discuss and support the implementation of new concept;
- g) determine the CNS requirements, interoperable entry/exit points or areas, connections into the TMAs, weather related issues, terrain aspects, airspace organisation which would be needed in order to support the implementation of the new concepts;
- h) achieve common understanding and support from all stakeholders involved in or affected by the ATM developments/activities in the three ICAO Regions; and
- i) use the AIRARD/TF meetings as a forum for bilateral and multilateral discussions (such as review of ANS Letters of Agreements).

1.2 In order to meet the Terms of Reference, the AIRARD Task Force shall:

- a) Discuss and review the ATS route network and airspace improvement projects which involve States (including the Military) and all aviation stakeholders (airspace users, international organisations and Computer Flight Plan Software/Service Providers (CFSPs)) across the three Regions;
- b) propose a strategy and prioritized plan for development of improvements to the route network and/or airspace structure to facilitate harmonized and synchronized trans-regional planning, highlighting:
 - areas that require immediate attention (solution of safety, capacity or complexity constraints);
 - interface issues with adjacent ICAO Regions;
- c) monitor and report on the implementation status of the prioritized plan;
- d) develop a roadmap for the implementation of new concepts such as the PBN highways;

- e) develop a working depository for route proposals that will be used as a dynamic reference document for ongoing discussions on routes under development/modification. In this respect, the Task Force should explore the utility that can be realized from the route catalogue concept/ATS routes database; and
- f) address CNS and ATM interface issues with other regions and make specific recommendations to achieve a harmonized and interoperable environment in the interface areas between the regions.

2. In order to effectively perform its tasks and responsibilities:

- a) The AIRARD TF shall elect Co-Chairpersons (one from a State and one from the airspace users) for a cycle of three meetings, unless otherwise re-elected.
- b) The TF shall meet at least once a year and/or when deemed necessary.
- c) The TF meetings should be hosted by its members on rotation basis.
- d) The TF shall report to the relevant ATM Groups in the APAC and MID Regions under the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), the European Air Navigation Planning Group (EANPG), North Atlantic Systems Planning Group (NAT SPG) and the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG).

3. COMPOSITION

The AIRARD Task Force is composed of:

- a) States from APAC, EUR/NAT and MID Regions, or States providing services in the APAC, EUR/NAT and MID Regions;
- b) concerned International and Regional Organizations; and
- c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

Terms of Reference

Asia/Pacific Unmanned Aircraft Systems Task Force (APUAS/TF)

Objectives: the objective of the APUAS/TF will be to develop guidance material that supports an Asia/Pacific Seamless ATM Plan element: B1-UAS. This element is expected to incorporate Aviation System Block Upgrade (ASBU) BI-RPAS (Remotely Piloted Aircraft Systems) but in addition, to include regional expectations for the regulation and safe operation of UAS (other than RPAS that fall within the scope of the ICAO RPAS Panel¹) within non-segregated airspace from an ATM perspective by November 2019, for consideration by the ATM/SG and APANPIRG. The guidance material for small UAS (generally 25kg or less) may include, *inter alia*:

- ~~reference to systems designed to ensure a commensurate safety against obstacles, protected airspace, aircraft and non involved people;~~
- ~~communication and surveillance systems for Air Traffic Services (ATS) that allow the effective management of safety risks in controlled and uncontrolled airspace; and~~
- guidance on elements to be considered for inclusion in model regulations that manage the manufacturing, sale and for the:
 - operation of UAS; and
 - technical or performance requirements of UAS; and that
 - may be applied at the point of manufacture or sale of UAS;
- ~~education processes to provide educate all UAS users operators or potential users operators, regulators and air navigation service providers and other stakeholders with information on appropriate UAS operations regulations and their application;~~
- ~~recommended methods of safety data collection and analysis for UAS incidents;~~
- recommended methods of safety data collection and analysis for UAS accidents and incidents, developed in coordination with the Asia/Pacific Regional Aviation Safety Group (RASG-APAC);
- ~~integration~~ alignment of regulations for small UAS with existing regulations for model aircraft;
- Consideration of regulations relating to small UAS operation both within and beyond visual line of sight;

¹ The ICAO RPAS Panel is developing Standards and Recommended Practices for RPAS that generally operate within the National Airspace Systems in the same way as manned aircraft, for inclusion in Annexes to the Convention on International Civil Aviation.

-
- Safety assessments for ~~small~~ UAS operations; and
 - Coordination with the UAS-AG, ~~and~~ JARUS, or other appropriate specialist ~~body~~ bodies.

To facilitate global harmonization the regulatory guidance developed by APUAS/TF should be shared with similar bodies in other ICAO Regions, and with UAS-AG through the ICAO Secretariat.

The APUAS/TF should report its progress with an interim update at the ~~ATM/SG/5 (2017)~~ and ATM/SG/6 (2018) ~~and ATM/SG/7 (2019)~~.

Meetings: the APUAS/TF will normally meet at least once a year, but twice a year when agreed by the APUAS/TF if required.

Membership:

The APUAS/TF membership will be formed by Asia/Pacific States/Administrations and International Organizations. Other non-Asia/Pacific States, and organizations involved in UAS manufacturing, regulation and operations may join the APUAS/TF at the invitation of the ICAO Regional Office.

Reporting: the APUAS/TF reports to the ATM/SG. The ATM/SG will coordinate with the RASMAG, CNS/SG, and the APRAST/RASG as appropriate before consideration by APANPIRG.

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

Considering that:

- 1) legacy AFTN circuits are required until the ground systems of ATM Service Providers (ASP) and Airspace Users (AU) in reliant states are compatible with ATS Message Handling Service (AMHS), the successor implementation of the Aeronautical Fixed Service (AFS);
- 2) the Aeronautical Telecommunication Network (ATN) is specified in ICAO SARPs and technical manuals as the network supporting AFS implemented using either OSI protocols (ATN/OSI) or the Internet Protocol Suite (ATN/IPS) for both ground-ground and ground-air services;
- 3) many states have implemented ATN and AMHS in accordance with ICAO guidance (regional BBIS providing dual OSI/IPS stack routing at the AMHS level);
- 4) AN Conf/12 endorsed the Global Air Navigation Plan version 4 including the Aviation System Block Upgrades of the Globally Interoperable Services and Data improvement area based on System-Wide Information Management (SWIM) message exchange patterns (specified in the SWIM Operational Concept as IP-based web services);
- 5) APANPIRG adopted the Seamless ATM Plan (Version 2) in 2016 which includes the regional objective for SWIM and Common aeronautical VPN (CRV) implementation; and
- 6) operational precedents of slightly different implementations of this SWIM concept exist in North America and Europe.

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

- a) Initiate transition ATSMHS and other applications to Internet Protocol Suite (IPS) based CRV. This would allow ATSMHS to be compatible to other regions using either CRV or other IP based networks.
- b) continue deploying the ground-ground ~~ATN~~ backbone network of AMHS Message Transfer Agents (MTA) needed to support operational ground-ground services (as the infrastructure supporting AFTN such as X.25 becomes obsolete) and the air-ground services expected to migrate to ATN/IPS.
- c) acknowledge ICAO's acceptance of IP sub-networking and the precedent of PENS in Europe and FTI in North America and consider the consequent potential for superior approaches to APAC's ATN which is deployed as an aggregation of private leased point-to-point and other circuits including the Public Internet;
- d) apply guidance from ICAO technical panels primarily the Information Management and Communications panels in progressing regional planning and co-ordination in terms of inter-state exchange of aeronautical, meteorological, flight information, voice communication services and surveillance data;

- e) permit BBIS and BIS States, and States in other regions with connections to the Asia/Pacific region, to connect their Message Transfer Agents (MTA) to BBIS States using either the OSI-based ATN Internet Communications Services (ICS) or the ATN IPS on a bilateral basis;
- f) permit States with limited traffic to operate only UA terminals connected to the MTA of another State, subject to bilateral agreement. Such connections should use the CRV's IP VPN. In cases where is not practical, use of the public Internet subject to appropriate security provisions and access control is acceptable;
- g) complete migration from AFTN to AMHS within the time frame specified in the Regional Air Navigation Plan;
- h) once a robust ATN has been established, transition from the OSI-based ATN ICS to the AMHS MTA network using the ATN/IPS as specified in ICAO Doc 9896;
- i) consider options for augmenting the operational regional ATN to meet future operational requirements (including virtualizing the ATN over generic sub-networking infrastructure/services capable of supporting other higher-level communication services in addition to the ATN).

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

- i) Enhance AMHS to include the File Transfer Body Part (FTBP) sub-set of extended AMHS in order to support the exchange of IWXXM data using FTBP;
- j) Australia, Fiji, New Zealand and USA to replace their obsolete South Pacific AFS Network equipment with a subscription to the CRV managed service. In addition to sustaining operational voice and ground-ground data services, validate the 10 key points of the CRV proof-of-concept;
- k) Remaining APAC states to monitor outcomes of the proof of concept and consider subscription to the CRV service if it is beneficial given their particular circumstance;
- l) When CRV pilot is completed and service is accepted, BBIS States should prioritize the transition of AMHS MTA to CRV as well as coordinate with BIS States to join. Conversion of legacy interfaces (X.25, X.25 SNDCEF, and IP SNDCEF) to IPS should be utilized to support the AMHS transition to CRV.
- m) States and ASP/AU to participate in the SWIM Task Force and nominate subject matter experts to implement Phases 2 and Phase 3 of the Seamless ATM plan Version 2 adopted by APANPIRG in 2016.
- n) Support the transition to FIXM with initial focus on the regional ATFM.

PBN NavSpecs and Route Spacing (Ref. PBN Manual Doc 9613 Volume II, Attachment B & PANS-OPS Doc 8168 Volume II, Part III, PANS-ATM Doc 4444, and Annex 15)

Nav Specs	Flight Phase								Supporting Nav. Infrastructure	Route Spacing (NM)	Additional Functionality (Repaired or Optional)					Operational Requirements				
	En-route Remote	En-route Continental	Arrival	Approach				Departure			RF	FRT	TOAC ²⁾	Baro VNAV	Nav DB	Communication	Navigation	Surveillance	AIM	Others
				Initial	Intermediate	Final	Missed ¹⁾													
RNAV 10 (RNP 10)	10							Not require ground based Naviad Dual LRNS (INS, IRS FMS, GNSS)	Lateral 50 between RNAV10, RNP4, or RNP2 Longitudinal 50 with DCPC, procedureal position report - Distance verification : at least every 24min 50 with reporting interval 27min 5min with reporing interval 14min						Voice com through 3rd party, DCPC in some areas. Longitudinal 50 with RCP240 (ADS-C)	RNAV 10 (RNP 10) Approval, lateral deviation less than 7NM (same direction)/6NM (opposite direction)	Procedural pilot position report (max 24min) 50 with RSP 180 (CPDLC)	WGS-84; QMS for AIS; AIRAC Compliance for publication (42 days, recommended 56 days); ICARD for new waypoint names; Air Navigation Plan Amendment for Regional ATS Routes; Regional Supplementary Procedures (Doc 7030) for application in airspace over the high seas; PBCS	System safety and datalink performance (PBCS) must be monitored, TLS 5X10 ⁻⁹ accident per flight hour Max ADS-C periodic reporting interval - 27min for 50NM - 14min for 5min	
RNAV 5		5	5 ³⁾					VOR/DME DME/DME INS or IRS GNSS	Lateral 16.5 - straight unidirectional racks (same direction route-ECAC) 18 - straight bidirectional tracks (opposite direction route- ECAC) 10 - ATC intervention capability (ECAC) 30 - No ATS Surveillance in high traffic density (ECAC)						DCPC- VHF	RNAV 5 OPS Approval (BRNAV)	Procedural pilot position report Surveillance (RNAV 5)	WGS-84; QMS for AIS; AIRAC Compliance for publication (42 days, recommended 56 days; ICARD for new waypoint names; Air Navigation Plan Amendment for Regional ATS Routes		
RNAV 2		2	2					GNSS DME/DME DME/DME/IRU	Lateral 8 to 9 - straight tracks in high traffic density (en-route) (FAA)						DCPC- VHF	RNAV 2 OPS Approval (PRNAV, US RNAV AC 90-100)	surveillance	Same as RNAV 5		
RNAV 1		1	1	1	1		1	GNSS DME/DME DME/DME/IRU	Lateral For SIDs/STARs (PANS-ATM) 7 between RNAV1 and RNAV1, RNP1. RNP APCH, or RNP AR APCH						DCPC- VHF	RNAV 1 OPS Approval (PRNAV, US RNAV AC 90-100)	surveillance	WGS-84; QMS for AIS; AIRAC Compliance for publication (42 days, recommended 56 days		

RNP 4	4								Not require ground-based Naviad GNSS	Lateral 50 between RNAV10, RNP4 or RNP2 23 between RNP4 or RNP2 (SLOP up to 2NM) - 12 for climbs/descends through aircraft in level 20 between RNP4 or RNP2 (No SLOP or SLOP up to 0.5NM) - 9 for climbs/descends through aircraft in level Longitudinal 50 with reporting interval 32min 30 with reportin interval 12min 5 min with reporting intercal 14min		O	TBD		R	DCPC or CPDLC. Requires PBCS (RCP240)	RNP 4 OPS Approval	ADS with a lateral deviation contract having 5NM. Requires PBCS (RSP180)	WGS-84; QMS for AIS; AIRAC Compliance for publication (42 days, recommended 56 days; ICARD for new waypoint names; Air Navigation Plan Amendment for Regional ATS Routes; Regional Supplementary Procedures (Doc 7030) for application in airspace over the high seas; PBCS	Conformance monitoring shall be ensured by establishing an ADS-C event contract specifying a lateral deviation change event with a maximum of 5 NM threshold and a waypoint change event Max ADS-C periodic reporting interval - 32min for 50NM - 12min for 30NM - 14min for 5min
RNP 2	2	2							GNSS	Lateral Apply minima in RNP4 if RNP2 is related Between RNP2 or GNSS equipage - 23 for SLOP up to 2NM, climbs/descends through aircraft in level - 20 for No SLOP or SLOP up to 0.5NM, climbs/descends through aircraft in level - 18 for SLOP up to 2 NM with VHF DCPC - 15 for No SLOP or SLOP up to 0.5NM with VHF DCPC - 10 for SLOP up to 2 NM with VHF DCPC, climbs/descends through aircraft in level - 7 for No SLOP or SLOP up to 0.5NM with VHF DCPC, climbs/descends through aircraft in level Longitudinal 30 with reportin interval 12min 5 min with reporting intercal 14min		O	TBD		R	Requires PBCS (RCP240) for Oceanic/Remote; For other areas, depends on operational considerations (route spacing, traffic density, complexity, contingency procedures)	RNP 2 OPS Approval (Oceanic/Remote/contine ntal)	Requires PBCS (RSP180) for Oceanic/Remote	Same as RNP 4	Conformance monitoring shall be ensured by establishing an ADS-C event contract specifying a lateral deviation change event with a maximum of 5 NM threshold and a waypoint change event Max ADS-C periodic reporting interval - 12min for 30NM - 14min for 5min
RNP 1			1	1	1		1	1	GNSS	Lateral For SIDs/STARs (PANS-ATM) 5 between RNP1 and RNP1, RNP APCH, or RNP AR APCH	O		TBD	O	R	DCPC (RNP 1 SIDs/STARs)	RNP 1 OPS Approval	Not required except reduced route spacing	WGS-84; QMS for AIS; AIRAC Compliance for publication (42 days, recommended 56 days)	
A RNP ⁴⁾	2	2 or 1	1 - 0.3	1 - 0.3	1 - 0.3	0.3	1 - 0.3	1 - 0.3	GNSS Multi-DME may be provided	Lateral 7 - straight and turning tracks (<90°) in high traffic density (en-route, Terminal, Eurocontrol) 6 to 7 NM with an RNP 0.5 (terminal, Eurocontrol)	R	O	TBD	O	R	DCPC- VHF	A-RNP OPS Approval (Navigation accuracy at least ±1NM, 95% of the flight time)	surveillance (may not be required to certain navigation application)	WGS-84; QMS for AIS; AIRAC Compliance for publication (42 days, recommended 56 days)	
RNP APCH (Part A) ⁵⁾				1	1	0.3	1		GNSS (Missed App - RNAV or Conv.)	Lateral For SIDs/STARs (PANS-ATM) 7 between RNAV1 and RNP APCH 5 between RNP1 and RNP APCH	O		TBD	O	R	Not required	RNP APCH OPS Approval	Not required	WGS-84, QMS for AIS, AIRAC, Compliance for publication (42 days, recommended 56 days)	

RNP APCH (Part B) ⁵⁾				1	1	Angular	1 or 0.3 (Initial Straight MISAP)		GNSS	Lateral For SIDs/STARs (PANS-ATM) 7 between RNAV1 and RNP APCH 5 between RNP1 and RNP APCH	O		TBD		R	Not required	RNP APCH OPS Approval	Not required	WGS-84, QMS for AIS, AIRAC, Compliance as above.	
RNP AR APCH				1 - 0.1	1 - 0.1	0.3 - 0.1	1 - 0.1		GNSS (DME/DME may be authorized)	Lateral For SIDs/STARs (PANS-ATM) 7 between RNAV1 and RNP AR APCH 5 between RNP1 and RNP AR APCH	R ⁶⁾		TBD	R ⁶⁾	R	Not required	RNP AR APCH OPS Approval	Not required	WGS-84; QMS for AIS; AIRAC Compliance for publication (42 days, recommended 56 days	
RNP 0.3		0.3	0.3	0.3	0.3		0.3	0.3	GNSS	Lateral (no clear reference) For SIDs/STARs (PANS-ATM) 7 between RNAV1 and RNP0.3 5 between RNP1, RNP APCH and RNP AR APCH	O		TBD	O	R	Not required	RNP 0.3 OPS Approval	Not required	WGS-84; QMS for AIS; AIRAC Compliance for publication (42 days, recommended 56 days	

1) RNP requirements do not apply to initial and intermediate missed approach segments.

2) TOAC (Time of Arrival Control), TBD (To Be Determined)

3) RNAV 5 may be used for initial parts of STARs outside 30 NM from the ARP.

4) Advanced RNP core requirements are limited to RNP 1 in all flight phases except final approach (RNP 0.3) and RNP 2 in oceanic/remote and en-route continental. A scaleability option will allow accuracy values between 0.3 and 1.0, in 0.1 NM increments, in all flight phases except oceanic/remote/en-route continental (RNP 1 and RNP 2) and final approach (RNP 0.3).

5) Part A and B refer to the Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, Part C, Chapter 5, Part A — RNP APCH operations down to LNAV and LNAV/VNAV minima and Part B — RNP APCH operations down to LP and LPV minima, respectively.

6) Specific requirement for RF and VNAV



INTERNATIONAL CIVIL AVIATION ORGANIZATION



ASIA/PACIFIC REGIONAL GUIDANCE
FOR
TAILORED METEOROLOGICAL INFORMATION AND SERVICES
TO SUPPORT AIR TRAFFIC MANAGEMENT OPERATIONS

Version 0.4.0, XX 2018

Adopted by APANPIRG/xx in September 20XX

RECORD OF AMENDMENTS AND CORRIGENDA

APPENDIX A to Agenda Item 3.5
APANPIRG/29

DRAFT

as of xxth XX 2018

TABLE OF CONTENTS

<To be inserted later>

1. Introduction

1.1 Purpose and overview of the guidance

This guidance aims to foster States' implementation and enhancement of meteorological (MET) information and services for air traffic management (ATM)¹ within Asia/Pacific (APAC) region.

The guidance captures most of the necessary processes from preparatory to operational phases. Furthermore, it provides detailed operational services, with specific examples and an operational scenario on ATM-tailored MET information and services. Information in this guide can also be used to facilitate further improvement by the States who have already implemented ATM-tailored MET services.

A stepwise (process-wise) structure of the guidance is expected to allow each State to refer to chapters, sections or subsections useful for the commencement, implementation or improvement of its MET information and services to support effective ATM.

1.2 Development of the regional implementation guide

ICAO APAC Meteorological Requirements Task Force (MET/R TF) 4th meeting, held in July 2015 in Tokyo, noted that so-called 'ATM-tailored' MET information, when provided to support international air navigation, is still required to comply with the Annex 3 'General Provisions'. However, the detailed technical specifications for the information are yet to be specified in Annex 3. The meeting also noted the specific regional guidance material is necessary to assist States in developing and implementing tailored meteorological information and services supporting effective ATM and agreed to develop the regional guidance material.

Ad-hoc group consisting of Australia, China, Hong Kong, China, Japan (rapporteur), New Zealand, Republic of Korea, Singapore, Thailand and Vietnam was tasked to develop a DRAFT regional guidance material for tailored meteorological information to support ATM operations.

Detailed historical background of efforts for implementation and enhancement of MET information and services for ATM in APAC Region is described in 1.4.

1.3 Importance of ATM-tailored MET information and services

With unprecedented growth in air traffic movements in the Asia/Pacific Region, ATM is paramount for the continued assurance of safe, efficient and timely aircraft operations. Recognizing the importance, various States have continued to evolve their ATM systems and procedures to meet the growing demand and to maintain safety as the priority. Additionally, neighbouring States are increasingly collaborating on activities

¹ Note. ATM is defined in PANS-ATM (Doc 4444) as follows;

The dynamic, integrated management of air traffic and airspace including air traffic services, airspace management and air traffic flow management – safely, economically and efficiently – through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

such as Air Traffic Flow Management (ATFM), which are enhanced by the incorporation of dedicated support from MET services.

Information sharing and collaborative decision-making (CDM) by relevant stakeholders are indispensable for the successful provision of effective and efficient ATM. Aircraft operations are influenced by atmospheric conditions and meteorological phenomena, and so adverse conditions can have a significant impact on ATFM planning and provision.

In Asia/Pacific, we experience diverse weather features on a daily basis as the region is influenced by climates varying from tropic to sub-polar and is further complicated by geography including both broad land masses and wide oceanic areas. It is therefore critical that the region's ATM, and particularly ATFM operations are supported by tailored MET information and services to ensure safe, efficient and orderly aircraft operations.

1.4 Historical backgrounds

Since ICAO endorsed the *Global Air Traffic Management Operational Concept* (GATMOC, Doc 9854) in 1996, States have worked on the enhancement of ATM. In the Asia/Pacific Region, since the late 1990s, ATM (and ATFM) has evolved significantly in several States. Subsequently, tailored MET information and services has been recognised as critical information for the effective provision of ATM and subsequently has been incorporated as part of the strategic and tactical ATM operations of those States. For example, in Japan, the Air Traffic Meteorology Center (ATMetC) of the Japan Meteorological Agency was established in February 2006, as a specialized MET service provider for the Air Traffic Management Center (ATMC) of the Japan Civil Aviation Bureau (JCAB).

In 2001, ICAO APANPIRG Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG) formed the MET/ATM Task Force (TF) to facilitate regional implementation of meteorological services in support of ATM. The first Regional MET/ATM Seminar was held at the ICAO Regional Office in Bangkok, Thailand, in February 2006. In order to enhance regional implementation, in 2009, APANPIRG agreed to call for the 1st meeting of the MET/ATM TF to plan the 2nd Regional MET/ATM Seminar and TF Meeting in 2010 timeframe. In February 2011, the Seminar and the 2nd meeting of the TF were held in Fukuoka, Japan, where experts from MET, ATM and other international organizations in the Asia/Pacific region gathered to discuss their plans and best practices on the development and implementation of meteorological services in support of ATM. The meeting also included a technical tour to the ATMetC to provide an example of the collaborative work undertaken between MET and ATM organisations. Subsequent TF meetings, and later the MET/R Working Group, successor to the MET/ATM TF, continued the important work of developing regional guidance to assist Asia/Pacific States with implementation or improvement of MET information and services to support ATM.

2. Implementation procedures

2.1 Preparatory phase (processes toward implementation)

2.1.1 Communication channel establishment

The most important step in the implementation of ATM-tailored MET information and services is to establish a good communication channel for mutual collaboration between MET and ATM organizations. To develop and facilitate an implementation plan, it would be useful to exchange views and information and build mutual understanding of each other's services, through regular consultations and meetings with clear focus.

In addition, consultation with collaborative decision-making (CDM) stakeholders from the initial stage will be desirable for smoother and better planning. This will further assist in implementation process, given that CDM is an essential element in ATM operational concept and concerned parties including airspace users², such as major airlines, are supposed to participate in CDM.

2.1.2 Service Identification

2.1.2.1 Understanding of ATM and aircraft operations

ATM operations vary in each State depending on its technical capabilities and characteristics of their responsible airspace. Better understanding of the State's ATM system is necessary to determine the scope of MET information and services to support ATM. This aspect will assist in understanding the local ATM requirements and determining the most appropriate process.

Additionally, procedures for aircraft operation adopted by airlines are also important in defining ATM-tailored MET information and services. The safety and efficiency of aircraft operations are fundamentally dependent on weather conditions. For example, each aircraft has maximum crosswind threshold values for take-off and landing. Adverse weather conditions may force aircraft to fly irregular flight routes and conduct unusual operations, which could result in significant diversion from the normal and planned distribution of air traffic. In this context, understanding aircraft operation procedures will be helpful in designing more *fit-for-purpose* MET information and services.

2.1.2.2 Past Events and Case Studies

Investigation on weather-related impact on air traffic flow is essential to determine what kind of MET information and services are required to effectively support ATM. One practical approach, in cooperation with airlines, is to compare operational records (including causes of delay, if available) with past weather data.

² Note. Airspace users is defined in Global Air Traffic Management Operational Concept (GATMOC) (Doc 9854) as follows;

The term airspace users mainly refers to the organizations operating aircraft, and their pilots.

Once ATFM is implemented, focus could be on more direct ways to use the flow management record in the ATFM process in addition to the aircraft operation record for the comparison with past weather data.

2.1.2.3 Service proposal (Proposal from MET organization)

Through the above-mentioned process, it is expected to obtain better understanding of the ATM processes based on aircraft operational procedures and possible weather impact on air traffic flow. The next step would be to develop a draft plan for MET information and services in support of ATM and propose it to the ATM organization. The proposed plan could be conceptual process with specific explanation and prototypes of MET information or services, if possible, to seek practical feedback from ATM organisation.

2.1.2.4 Service development (Requirements from ATM organization)

With the feedback from the ATM organization described in 2.1.2.3, the MET and ATM organisations could modify and make necessary changes to the proposed plan. This will ensure both parties (MET and ATM) are aware of the requirements and limitations and are able to adopt a practical plan for the region.

This would be an iterative process, until the proposed plan for MET information and services becomes matured.

2.1.2.5 Service definition

When the proposed plan becomes well matured through the processes above, the provision of MET information and services in support of ATM can be formalized. The plan should also describe how the ATM tailored MET products will be utilised in conjunction with the published MET products, are made available to the airspace users in a timely fashion so that all stakeholders are in possession of the same information at the same time. It may be that bespoke MET information solutions, tailored to the specific ATM service provider, are also made available to the airspace users as part of CDM arrangements.

2.1.3 System development

The next step is to develop a system and associated software applications necessary to provide ATM-tailored information and services defined in the process 2.1.2.5.

2.1.4 Trial run of the system and service

It is essential to conduct a trial run of the system and procedures to test secure delivery of the defined MET information and services. If any issues are identified through the trial run, these issues have to be resolved through close consultation with the stakeholders concerned (mainly the ATM organizations), before installation and commencement of services. In addition, the trial process will assist in determining the

level of confidence. The outcomes of the trial should be well documented to assist with the future requirements.

2.1.5 Service provision agreement

In parallel with the system development, to ensure continuous provision of the defined information and services is maintained, it is important to formalize a written agreement (or to amend an existing agreement, if applicable) between the MET and ATM organizations. The Agreement should include the MET and ATM capabilities, and outline the operational processes, the working relationship and the communication channels. When such an agreement is later implemented with airlines or other stakeholders, existing agreements should also be amended accordingly.

2.2 Operational phase (processes for continuous improvement)

2.2.1 Operational trial

Before MET information and services are provided operationally, an operational trial should be conducted so that forecasters and ATM officers can familiarize themselves with the provision and usage of the new information and services. The trial period should be set based on agreement between the parties concerned. A post implementation of the operational trial should be conducted to ensure lessons learned from the process are documented and improvements are made prior to implementation.

2.2.2 Provision of MET information and services

MET information and services developed according to the process described in 2.1 are provided to ATM officers in accordance with the service provision agreement between the MET and ATM organizations.

2.2.3 Verification and evaluation

After the implementation of ATM-tailored MET information and services, it is required (i) to regularly verify and evaluate its quality to ensure that it practically supports ATM and (ii) to improve MET information and services.

2.2.4 Continuous improvement

Regular evaluation meetings between relevant parties such as airspace users, ATM and MET organizations are one of the basic approaches to continuously improve the implemented information and services. When a weather event has a significant impact on ATM, it is also recommended that stakeholders conduct a post-event analysis to identify lessons learnt and subsequent improvements.

3. MET information and services in support of ATM

In this chapter, MET information and services which are effective for supporting ATM operations are listed. As it will require cost, resources, technology, and

time to introduce all of the products and services, some of which may not be defined in ICAO Annex 3, it is worthwhile to consider implementing them in a stepwise manner, depending on the situation in each State.

Examples of MET information and services for ATM in some States are described in Appendix 1. In addition, operational scenarios of MET/ATM collaboration, such as how MET information and services are provided to ATM officers, are described in Appendix 2.

3.1 Participation of MET organizations in CDM

CDM is an approach where relevant stakeholders share necessary information in order to make decision collaboratively, enabling enhanced ATM operations. MET CDM is a process involving meteorologists with an understanding of the effects of weather on ATM so as to support an accurate prediction of arrival/departure rates and en-route information. This process involves a collaboration of CDM stakeholders to generate products suitable for better pre-tactical traffic management strategies and optimised use of available capacity. The expected role of a MET organization in CDM is to provide necessary meteorological information at and around relevant aerodromes and air routes in a timely manner.

To achieve effective CDM, aeronautical meteorologists should have a basic understanding of ATM and Air Traffic Control (ATC) procedures, such as, inter alia, runway weather minima and aircraft operating criteria so that they would be able to foresee aviation impacting weather and provide appropriate briefings to ATM and ATC in a timely manner.

In a case where an event or phenomena has a significant impact on normal air traffic flows (e.g.: mass deviation of aircraft), it is vital to ensure that common situational awareness is maintained at all times among affected stakeholders. Rapid identification of the possible cause of such a situation (e.g. adverse weather condition, runway closure) allows both ATM and MET organizations to take immediate action in a collaborative manner to mitigate the impact.

3.2 Weather briefing in support of ATM

Direct weather briefings for ATM officers is an effective method to share current and expected weather assessments in and around major aerodromes and air routes, including any expected impacts on aircraft operation and air traffic flow.

Regular weather briefings in support of ATM may be provided several times per day. Depending on rostered shift arrangements in ATC centres, MET briefings may be scheduled for groups of controllers just prior to commencing their operational duty.

Where unexpected weather phenomena may affect aircraft operation and/or air traffic flow, or the actual weather deviates significantly from that forecast, a special briefing should be provided by MET forecasters. Special briefings can be either proposed by MET forecasters or requested by ATM officers.

3.3 ATM-tailored meteorological information

3.3.1 Impact-based weather information

Tailored MET information that shows possible impact on air traffic flow (e.g. when and where the weather phenomenon affects air traffic flow) can be useful to support the management of air traffic capacity in each ATC sector and execution of air traffic flow controls.

Information that can be more specific on the impact to air traffic flow will be extremely valuable; for example, a probabilistic forecast of impact to ATFM may provide a quantitative estimate of reduction in air traffic capacity. To develop such *impact-based* information, consensus among stakeholders has to be developed regarding relationships between specific weather events and their possible impacts on air traffic flow.

3.3.2 Information for common situational awareness

It would be helpful for ATM representatives and other relevant stakeholders to understand the backgrounds of such the relevant weather phenomena (e.g. occurrence process and characteristics), as well as the associated forecast confidence, which would facilitate risk assessment and more effective and efficient ATM operations. It is desirable to provide relevant graphical information which can explain weather phenomena effectively, such as pressure distribution chart or weather radar and satellite imagery, and/or weather advisories with simple descriptions.

3.4 Information and products developed for other use

Existing meteorological information may also be useful to support ATM. Some examples are listed below.

- OPMET information
- Volcanic ash advisory (VAA) and tropical cyclone advisory (TCA)
- WAFS products (WINTeM chart, SIGWX chart and gridded global forecast of cumulonimbus clouds, icing and turbulence)
- Two-minute real-time observation data at congested aerodromes
- Weather radar imagery
- Specific phenomena based information, such as Thunderstorm and lightning information
- Satellite imagery and derived products
- Nowcasting products
- Numerical weather prediction data and derived products
- Earthquake and tsunami information

3.5 Means of provision

3.5.1 Dedicated information sharing system

To facilitate CDM, information sharing among all relevant stakeholders in MET and ATM is necessary, to enable common situational awareness is maintained. In order to support ATM operations, a system should be acquired or developed which enables ATM officers to utilize MET information at any time. Similarly, MET forecasters need an environment through which they can look at ATM-related information to provide appropriate meteorological information. It is thus required that dedicated systems for information sharing between MET and ATM organizations be established, so that ATC officers and MET forecasters can effectively exchange necessary information at any time, and preferably from their operational positions.

3.5.2 Means of communication

Listed below are some examples of means for which ATM stakeholders to communicate and to share necessary information with each other.

- Hotline (direct phone line)
- Web-chatting system
- Telephone or video conference system
- Use of common CDM software/application
- Joint use of an operation room
- Information sharing web-portal

4. Future progress in MET/ATM services

4.1 Global Air Navigation Plan (GANP)

In 2014, the 38th Session of the ICAO Assembly amended the Global Air Navigation Plan (GANP) and formulated the Aviation Systems Block Upgrades (ASBUs), the implementation plan of the GANP, as proposed by the twelfth ICAO Air Navigation Conference (AN-Conf/12). The ICAO Meteorology Panel (METP) was established in September 2014 and is now discussing the future introduction of new standard practices of MET information and services in support of ATM for the terminal area, along with the ASBU Block 1, which is to be ready by 2019.

In the future, States in a position to do so would be required to provide ATM-tailored MET services based on globally consistent requirements. Since this global standardization is being welcomed among users such as airlines and pilots, the States in the Asia/Pacific Region may adapt their systems accordingly when such standards are available.

4.2 Future integration of MET information into ATM decision-making

The ICAO Air Traffic Management Requirements and Performance Panel (ATMRPP), in coordination with the METP and other panels concerned, has discussed future integration of MET information into ATM decision-making system, along with

the Global Air Traffic Management Operational Concept (GATMOC). The “Concept for the integration of Meteorological information for ATM” has been developed by the ATMRPP and other bodies concerned. It provides guidance on methods and procedures to interpret MET information as it relates to possible constraints on air traffic flow. It supports estimation of the potential impact of the meteorological condition to ATM and provides ATM officers with possible actions to be taken, e.g. selecting most safe and effective diversion routes.

4.3 Next generation air transportation system developments

To deal with growing air traffic congestion, some States or Regions have been planning the development of next generation air transportation systems. These include NextGen (United States), SESAR (Europe) and CARATS (Japan). It is important for MET organizations to make the best effort to improve their capability in the provision of MET information and services to meet such future requirements and facilitate the development of a new generation air transportation system.

Appendix 1 Specific Implementation Examples

Hong Kong, China

1. ATM-tailored MET information and services

Under the agreement between the Hong Kong Observatory (HKO) and Civil Aviation Department (CAD), HKO provides a suite of ATM-tailored MET information and services in support of international air navigation.

1.1 Tactical Decision Products

1.1.1 Taking the opportunity of the replacement of CAD's Air Traffic Management System (ATMS), closer integration of tailored MET information with ATMS was realized to support ATC in tactical decision making. These include a) 10 layers of Constant Altitude Plan Position Indicator (CAPPI) imageries from 1 km to 10 km with range 256 km of the two Doppler weather radars in Hong Kong; and b) 1 layer of the HKO Aviation Thunderstorm Nowcasting System (ATNS) 1hr forecast for the assessment of the significant convection over HKFIR at 3 km height.

1.1.2 On the ATC console of the new ATMS, either weather radar imagery of a specific height or an ATNS forecast can be chosen to be overlaid with the aircraft indicators (Figure 1). Further details can be found in the presentation included in Joint Session ATFM/SG/7 and MET/R WG/6.

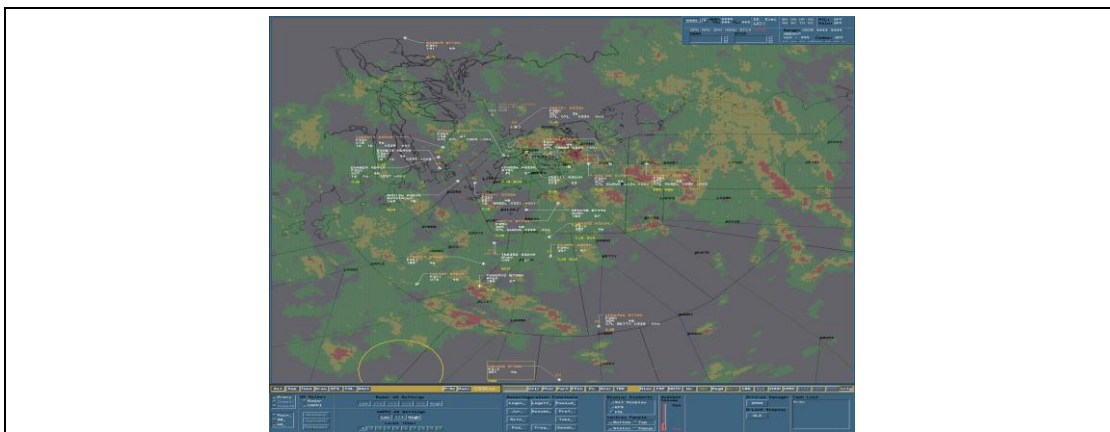


Figure 1. ATC console display showing aircraft positions overlaid on a CAPPI imagery

1.2 Meteorological Services for Terminal Area (MSTA) Products

1.2.1 The Hong Kong Air Traffic Flow Management Unit (ATFMU) of CAD regularly assesses the capacity of the Hong Kong International Airport (HKIA), which depends on both the runway and airspace capacity, in the next few hours. In collaboration with CAD, HKO has been providing tailored MSTA, grouped under the product named Significant Convection Monitoring and Forecast (Figure 2), to support ATFM operation since 2010. These are briefly summarized in the following paragraphs. Further details can be found in MET/R TF/3 WP07.

APPENDIX A to Agenda Item 3.5 APANPIRG/29

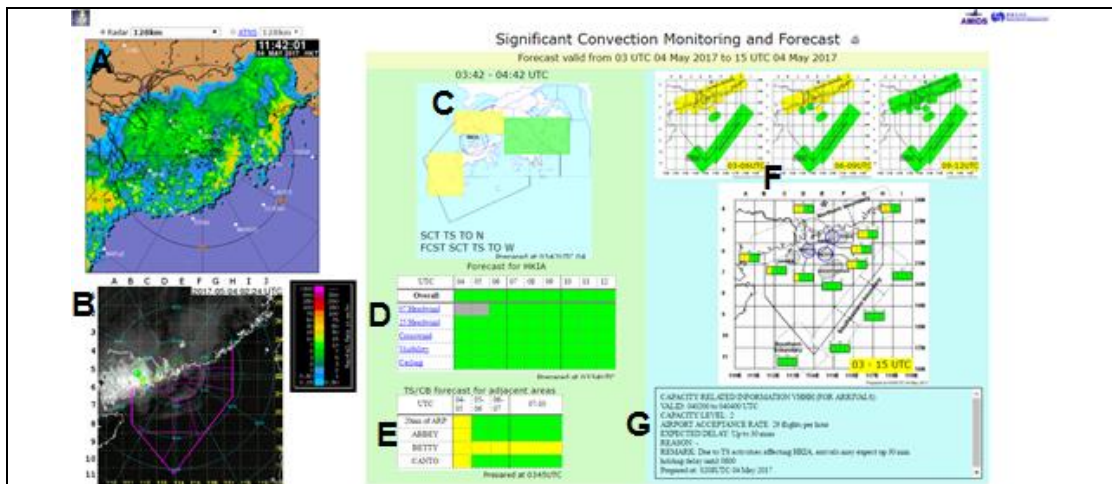


Figure 2. Integrated web display of the MSTA forecast suite including : A) Choice of Real-time radar and lightning data picture or ATNS forecast; B) Composite of latest radar and deep convection satellite image; C) 1hr convection nowcast for arrival/departure corridors; D) 9hr performance-based weather forecast for the aerodrome; E) 6hr blended convection forecast around HKIA and the major waypoints; F) 12hr significant forecast time series for key ATC areas; and G) Airport Capacity Notification issued by ATFMU/ATC of CAD to airports within the region.

1.2.2 The suite of MSTA products to support runway capacity estimation includes: a) ATNS to automatically forecast the future location of weather cells that may block the intended flight path or significant points in the airspace; b) a 1hr convection nowcast for arrival/departure corridors; c) a 6hr convection forecast for the aerodrome (20nm of airport reference point, ARP) and the major waypoints; and d) a 9hr performance-based weather forecast for the aerodrome. To support airspace capacity estimation, the HKO provides a 12hr significant convection forecast time series for key areas in the HKFIR based on blended NWP and nowcasting outputs. While the forecasts of these products are generated automatically, they could be adjusted manually by Aviation Forecasters.

1.2.3 All the above products/systems use three levels of colour code to indicate the impact to air traffic, viz GREEN for mild or no impact, AMBER for medium impact and RED for significant impact. Though the actual criteria for defining the colour codes vary across different forecast products, the simple three levels of colour code are adopted uniformly in all the forecast/nowcast products described above. The Significant Convection Monitoring and Forecast also includes the latest capacity notification issued by ATFMU/ATC after taking into account the above significant convection nowcast and forecast information as well as consultation by Aviation Forecaster via regular and ad hoc weather briefings (para.1.5 below).

1.3 Arrival Management and other Miscellaneous tailored Products

1.3.1 25 layers of gridded upper wind and temperature forecasts over southern China and the northern part of the South China Sea at a resolution of 0.2 degrees at hourly interval for up to 24 hours are provided for trajectory prediction of individual aircraft for

APPENDIX A to Agenda Item 3.5 APANPIRG/29

collision avoidance. The data is also being used by an Arrival Management application system for aircraft arrival sequencing.

1.3.2 Apart from the above products, other major tailored products include a) Weather Summary for HKIA which includes, inter alia, local winds, radar, satellite, lightning information and lightning alert for the airport, weather synopsis, aerodrome forecast with possible alternative scenario, TAFs of nearby airports, SIGMET for the HKFIR, TC track, weather analysis and forecast charts as well as the latest airport capacity notification (Figure 3); and b) HKIA Local Routine/Special Report and MET page showing the latest observation report, data from the Automatic Meteorological Observing System, windshear alerts, forecast of HKIA and neighbouring aerodrome, and a probabilistic wind forecast time series (Figure 4) at HKIA based on ensemble model outputs to facilitate uncertainty assessment during TC situation.

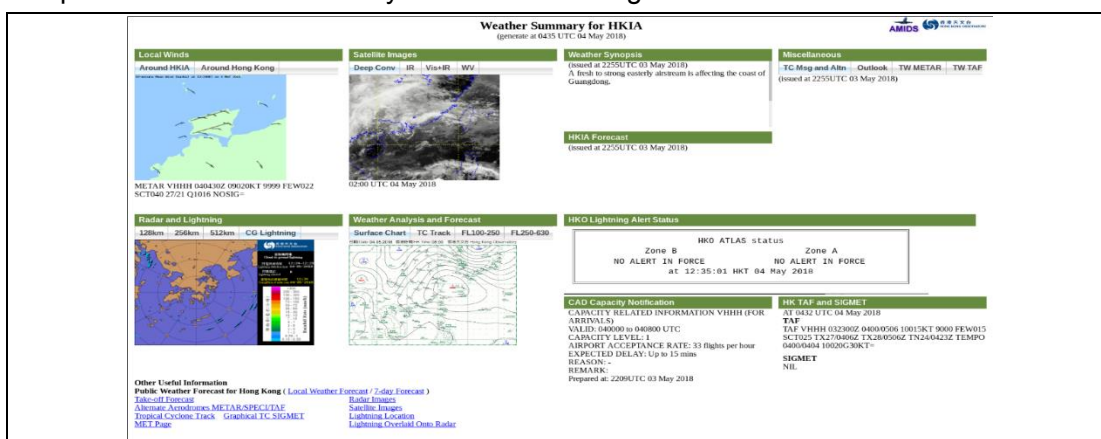


Figure 3. Weather Summary for HKIA provided by HKO

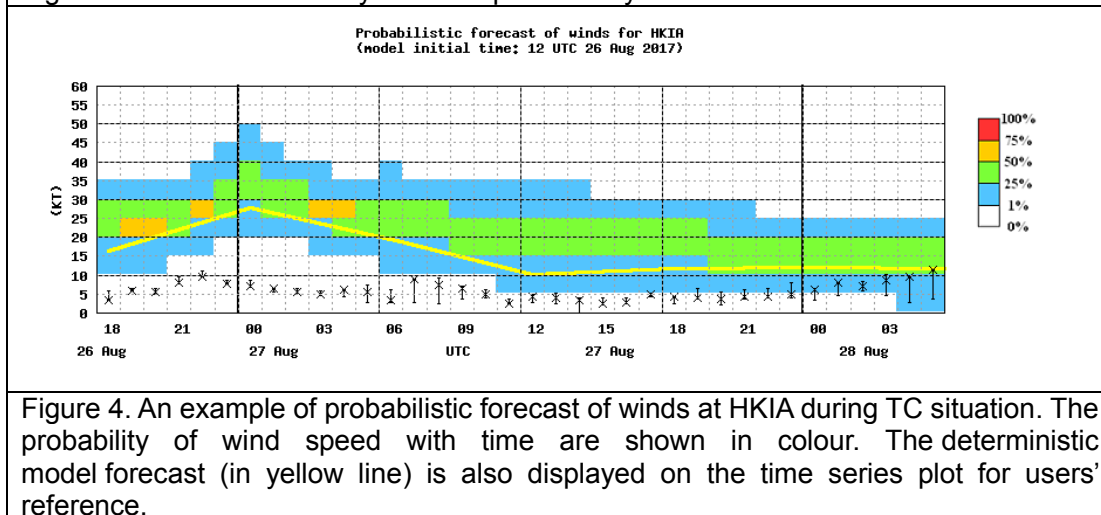


Figure 4. An example of probabilistic forecast of winds at HKIA during TC situation. The probability of wind speed with time are shown in colour. The deterministic model forecast (in yellow line) is also displayed on the time series plot for users' reference.

1.4 Lightning Nowcast Products

1.4.1 For the protection of ground personnel from being injured by lightning strikes, the HKO has developed the Airport Thunderstorm and Lightning Alerting System (ATLAS), a nowcasting system for detecting and nowcasting lightning activities over HKIA. The system will generate RED or AMBER alerts based on either detection or forecast of

APPENDIX A to Agenda Item 3.5
APANPIRG/29

cloud-to-ground lightning activities (CG). When CG is detected within 10 km or forecast to be within 5 km from the ARP, AMBER alert will be issued. When CG is detected or forecast to be within 1km boundary of the airport island, RED alert will be issued. To further enhance ground staff safety, the system will also generate a “Wireless Headset Procedure” alert to promote them to switch to use wireless headsets when CG is detected within 16 km of the airport.

1.5 Weather briefing

1.5.1 HKO provides twice daily MET weather briefings to ATFMU/ATC, once in the early morning and once in the early afternoon, through teleconference. The briefing mainly makes use of the MSTA products and the Weather Summary for HKIA discussed under 1.1 and 1.3.2 above. Timely updates are also provided through a hotline should there be any change in the weather conditions.

1.5.2 In preparation for adverse weather such as the approach of tropical cyclone (TC), additional weather briefings are conducted for the whole aviation community at HKIA to heighten common situation awareness and to support Collaborative Decision Making.

2. Means of Provision

2.1 The tactical decision products and the arrival management products discussed under para. 1.2 and 1.3.1 respectively are ingested directly into CAD's ATMS. Products under para. 1.3.2 b) are sent to CAD's ATS Data Management System (ATSDMS).

2.2 The rest of the products, including MSTA and miscellaneous tailored products are provided via the web-based Aviation Meteorological Information Dissemination System.

3. Other useful information

3.1 Regular high level meetings with CAD and the Airport Authority Hong Kong are held on an annual basis. Regular working level meetings with ATC are held generally a few times every year.

3.2 A Verification System has been set up for verification of both the ICAO Annex 3 and MSTA products.

APPENDIX A to Agenda Item 3.5 APANPIRG/29

Japan

1. ATM-tailored MET information and Services

1.1 ATMetC

The Japan Civil Aviation Bureau (JCAB) established the Air Traffic Management Center (ATMC) in Fukuoka in 2005 as a core organization for ATM in Fukuoka FIR. In line with ICAO's global concept for ATM, ATMC facilitates safe and efficient flight operation through ATM close cooperation with Airspace Management (ASM), Air Traffic Flow Management (ATFM) and oceanic ATM. At the same time as ATMC began operation, the Japan Meteorological Agency (JMA) established the Air Traffic Meteorology Center (ATMetC) to provide meteorological information and services in support of ATMC. ATMetC forecasters work in the same operation room as ATM officers to directly provide weather information and briefings tailored to ATM officers' needs. MET information and services specifically tailored for ATM requirements are as follows.

1.1.1 Air Traffic Meteorological Forecast (ATMet Category Forecast) (Figure 1)

- Target areas: major aerodromes and ATC sectors
- Contents: the potential for meteorological impact on air traffic flow with four color-coded categories (red, yellow, blue and white)
- Issuance time: every hour except from 14 to 16 UTC (midnight)
- Forecast time: up to 6 hours

1.1.2 Briefing sheet (Figure 2)

- Target: Strong wind for Tokyo (RJTT) and Heavy snow for New Chitose (RJCC)
- Contents: the probability of occurrence of impact on air traffic flow with four color-coded categories
- Issuance time: when significant weather is forecasted within 12 to 15 hours
- Forecast time: up to 16 hours

1.1.3 CDM conference

- Target areas: Fukuoka FIR and neighbor FIRs
- Providing methods: TV teleconference system
- Regular conference: 0620 and 2345 UTC
- Extra conference: As necessary (except midnight)

(UTC)	02	03	04	05	06	07	08
RJCC							
RJAA							
RJTT							
RJGG							
RJBB							
RJFF							
ROAH							
S01							
S02							
S03							
S04							
S21							
S24							
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F08							
F11							
F15							
F16							
F17							
H01							
H02							
H06							

Figure 1 ATMet Category Forecast

1.1.4 Briefing (regular/extra)

- Target areas: Fukuoka FIR
- Providing methods: Face to face or information-sharing terminal at ATM officer's desk
- Regular briefings: 0130, 0445, 0550, 0915, 1200, 1945, 2000, 2220, 2315 UTC
- Extra briefings: As necessary (24 hours)

1.2 TMAT

To deal with increasing air traffic demands in Tokyo metropolitan area, JCAB organized the Traffic Management Units (TMUs) in 2011 as a branch of ATMC and they were placed at Tokyo international airport and Tokyo Area Control Center in order to conduct tactical and flexible ATFM in and around the Tokyo metropolitan area. JMA organized Tokyo Metropolitan Area Team (TMAT) at Tokyo international airport in 2014 as a branch of ATMetC to provide TMUs with meteorological information and detailed briefings focused on significant weather which affects air traffic flow in and around the Tokyo metropolitan area, including the approach control area of Tokyo / Narita international airport and its neighboring area.

1.2.1 ATM CIEL (Figure 3)

- Target areas: Tokyo/Narita international airport, Tokyo approach control area and ATC sectors around Tokyo metropolitan area
- Contents: Level of expected impact of significant weather on ATM
 - ✧ High : Need to reduce capacity value (CAPA) significantly
 - ✧ Medium : Need to reduce CAPA
 - ✧ Slight : Need to reduce CAPA slightly
 - ✧ None : Not need to reduce CAPA
- Issuance time: every hour except from 14 to 16 UTC
- Forecast time : up to 6 hours (temporal resolution: 10 minutes to 1 hour)
- Targeted weather phenomena:
 - ✧ Tokyo/Narita international airport: Thunderstorm, Visibility, Ceiling, Wind, etc.
 - ✧ In and around the Tokyo approach control area: CBs, Convective clouds and Wind

1.2.2 Wx Bulletin (Figure 4)

- Target areas: Tokyo/Narita international airport, Tokyo approach control area and ATC sectors around Tokyo metropolitan area
- Contents: Brief comments on phenomena expected to affect air traffic flow, and appropriate images to explain weather conditions and forecast
- Issuance time: 00 and 06 UTC

As prompt decision making is required for ATM within terminal area, speedy and appropriate information sharing is necessary. Especially for weather briefing services, TMAT coordinates with TMUs whenever needed using online chat tool developed by JMA which enables quick information provision, in addition to video conference and telephone. As text information remains in the chat tool, TMU officers can reaffirm the contents of briefings at any time. Also, graphical information can be posted on the tool. This function helps TMU officers to easily understand the weather condition which is sometimes difficult to grasp only by the explanation on the telephone.

APPENDIX A to Agenda Item 3.5 APANPIRG/29

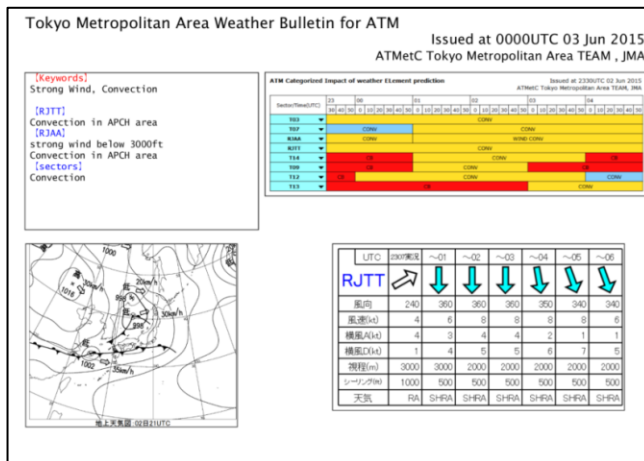


Figure 4 WX Bulletin

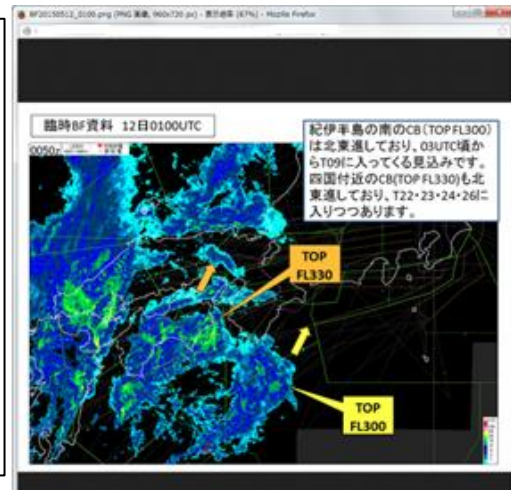


Figure 5 Graphical info on online chat

3. Other

3.1 Verification

ATMet category forecast criteria are weather conditions (or sometimes a combination thereof) defined through verification processes carried out by ATMetC in coordination with ATMC. This process involves three main steps:

- Investigation of impacts on ATM in previous significant cases;
- Confirmation of operational rules and conditions with reference to aircraft operation manuals and flight operations manuals; and
- Checking of the latest requirements from ATM officers, such as high-priority airways and altitude, and important air navigation facilities (waypoints or typical holding areas).

Each criterion is verified by calculating the Weather Impact Ratio (WXIR), which is the ratio of the frequency of cases in which a weather condition has influenced air traffic flow to all cases of the weather condition concerned.

$$\text{WXIR} = (\text{Number of occurrence of air traffic controls}) / (\text{Number of occurrence of WX conditions})$$

Meteorological services provided to support ATM need to be flexibly applicable to the various operational variables of such management, including ATC procedures, airways and aircraft types, which are also developed in parallel. It is therefore highly important to ensure close and continuous coordination with ATM officers in order to revise criteria appropriately based on the results of verification using WXIR in consideration of operational requirements. Through such continuous improvement, the gap between ATM operational requirements and MET capability can finally be closed (Figure 6).

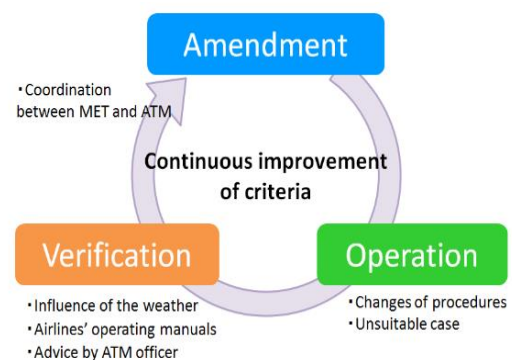


Figure 6 Continuous improvement of criteria

Singapore

1. ATM-tailored MET information and services

Meteorological and Air Traffic Management (MET/ATM) Collaboration in Singapore

The provision of air navigation services in the Singapore Flight Information Region (FIR) is undertaken by the Civil Aviation Authority of Singapore (CAAS), and Meteorological Service Singapore (MSS) is the aeronautical meteorological service provider. The following lists some examples of MET information and services implemented in Singapore, specifically tailored for ATM requirements.

1.1 Weather briefing for ATC

MSS provides daily MET weather briefings through teleconference to air traffic controllers at the start of the morning shift. Aided by visuals from a dedicated weather information portal which provides an integrated view of meteorological information in graphical and tabular formats (Figures 1), operational meteorologists will bring air traffic controllers through the weather conditions that can be expected around Singapore and the surrounding region. Timely updates are also provided by operational meteorologists through a hotline should there be any change in the weather conditions.

1.2 MET Support for Air Traffic Flow Management (ATFM)

In support of CAAS' operational trial with other air navigation service providers (ANSP), airlines and airport operators based on the multi-nodal ATFM concept for the region, MSS worked closely with CAAS to customize MET products to enable air traffic flow planning. Close weather watch is provided for key areas, such as the approach and departure paths of the airport and the holding areas that serve arrivals into the airport. To match the planning horizon for ATFM, the forecast period extends up to 6 hours ahead, in 30-minute and hourly blocks for specific periods as agreed with CAAS. The forecast is presented in color-coded, tabular format for easy interpretation and to support air traffic flow planners' decision-making.

1.3 Improvements to SIGMET Information

To augment SIGMET information for the Flight Information Region (FIR), forecast of significant weather up to 12 hours ahead is provided for the different sectors of the FIR. This serves to extend the period covered by SIGMETs. In addition, MSS is also working with MET Watch Offices (MWOs) of neighboring States in a WMO SIGMET

APPENDIX A to Agenda Item 3.5 APANPIRG/29

Pilot Project to coordinate the issuance of cross-FIR SIGMETs to airspace users, air traffic controllers and planners with significant meteorological information that is harmonized for weather phenomena straddling across two or more FIRs.

1.4 Nowcasting for convective weather

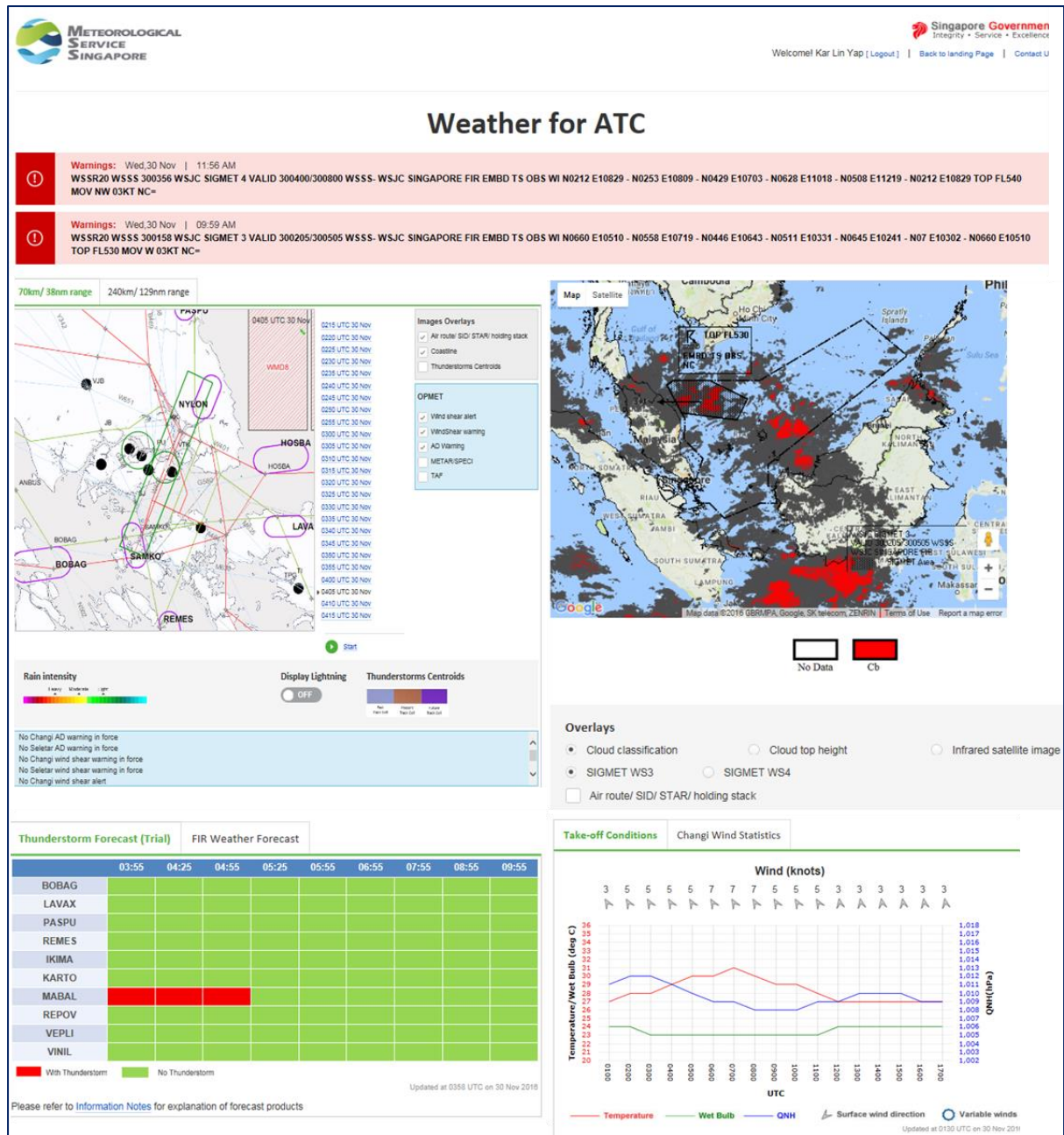
Tropical weather systems tend to be dominated by thunderstorms that are localized and short-lived but yet have great impact on air traffic operations. Given the nature of our local weather systems, there is limited predictability, and forecasts tend to be short range. This poses difficulties for ATM. To address these challenges, Singapore has a multi-year project in collaboration with UK Met Office to develop Numerical Weather Prediction (NWP)/Nowcasting capability for Singapore. The project aims to build a tropical convective-scale NWP/Nowcasting system that can provide improved weather forecasts to support ATM decision making.

2. Means of Provision

2.1 ATC Weather Information Portal

MET information is provided via ATC weather information portal, such as radar images satellite images with graphical SIGMET, graphical forecast of take-off conditions and trial i colour-coded thunderstorms forecast for holding stacks. (Figure 1)

APPENDIX A to Agenda Item 3.5 APANPIRG/29



APPENDIX A to Agenda Item 3.5
APANPIRG/29

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Appendix 2 Operational Scenario – Case of MET/ATM Collaboration –

Scenario 1:

CBs affected air traffic flow around approach control area of Tokyo International Airport (18 August, 2015)

1. Overview

A developing squall line was moving eastward along the coast of Tokai and Kanto Region of Japan. It caused many deviations from the planned air-routes and holdings in and around the terminal area, for aircraft approaching from west to Tokyo International Airport (RJTT). The Air Traffic Management Center (ATMC) reduced air traffic capacity (CAPA) in the affected ATC sectors, such as sector T09 and T14, and executed air traffic flow controls for aircraft flying in / heading to the air space. In addition, because some westbound aircraft departed from RJTT were forced to enter into neighboring sectors, such as sector T12 and T13, to avoid developed CBs of the squall line, ATMC finally conducted capacity reduction and flow controls for those ATC sectors to prevent possible conflicts between eastbound and westbound aircraft within those sectors (See Fig. 1 and Fig. 2).

This case shows how MET forecasters and ATM officers collaboratively dealt with this adverse weather condition described above, which occurred around a congestive international airport.

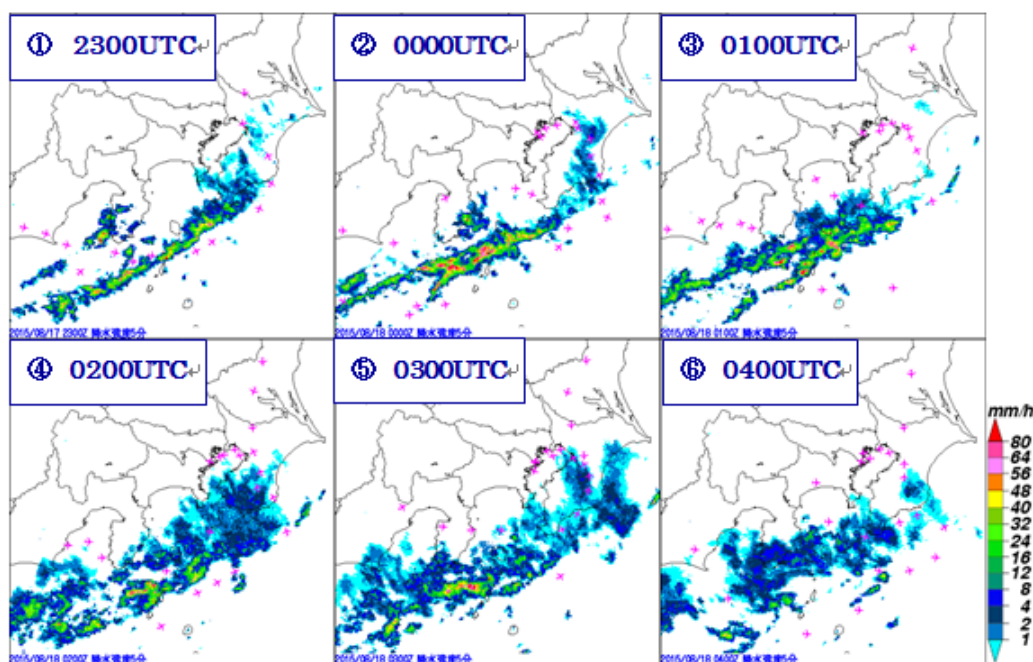


Figure 1 Radar echo intensity from 23:00 UTC 17th August to 04:00 UTC 18th August. Airplane-shaped marks indicate aircraft positions.

APPENDIX A to Agenda Item 3.5
APANPIRG/29

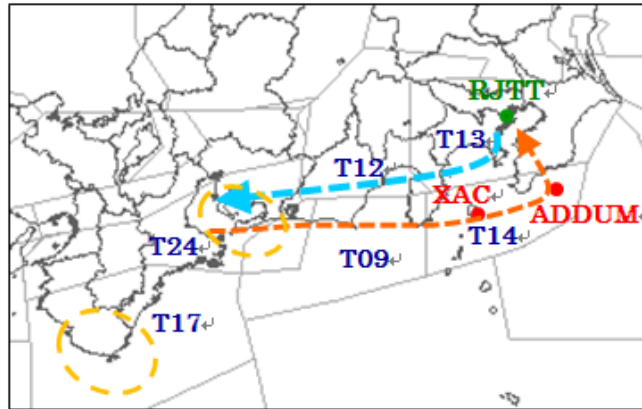


Figure 2 Name of ATC sectors (blue text) and reporting points (red text)

- Yellow circle: Holding area for aircraft flying to RJTT
- Orange arrow: Regular air-routes for aircraft approaching from western Japan to RJTT
- Light blue arrow: Regular air-routes for aircraft flying from RJTT to western Japan

2. MET/ATM collaboration

Described below is the collaborative actions taken by MET forecasters and ATM officers in this case (MET: Air Traffic Meteorology Center, Japan Meteorological Agency (ATMetC/JMA), ATM: Air Traffic Management Center, Japan Civil Aviation Bureau (ATMC/JCAB))

17th August 2015

20:00 UTC Special briefing was provided by MET

MET: "Echo top height of the CB clouds would reach more than FL460 in sector T09."

MET: "CB clouds will approach sector T14 around 21 UTC and then Tokyo Approach Control Area (ACA) around 22 UTC."

20:40 UTC Latest status of air traffic was reported by ATM

ATM: "Deviations have occurred in sector T17 and T09, because of CB clouds. We are now watching the situation of these CB clouds carefully."

21:00 UTC Special briefing was provided by MET

MET: "The CBs in sector T09 will approach XAC (reporting point) around 22 UTC and then ADDUM (reporting point) around 23 UTC."

ATM: "When will the CBs go away from Tokyo ACA?"

APPENDIX A to Agenda Item 3.5 APANPIRG/29

MET: “It will be after 00 UTC of 18th.”

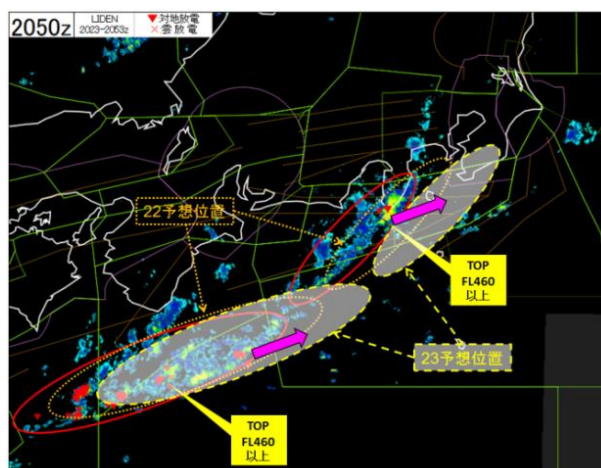


Figure 3 Material for non-regular briefing at 21:00 UTC on 17th August

21:20 UTC EDCT¹ was issued for flights heading to RJTT from west

22:00 UTC CAPA² was reduced to 93% in sector T09

22:10 UTC EDCT was issued for flights heading to RJTT through sector T09

23:08 UTC Special briefing was provided by MET

MET: “The CBs near XAC are now moving east and will approach ADDUM around 00 UTC.”

MET: “The CBs newly developed around sector T09 will move to the eastward. Then it will be merged with CB cloud area of the east.”

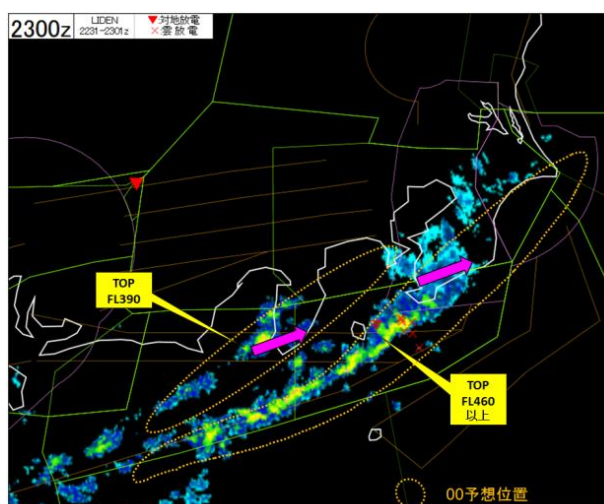


Figure 4 Material for non-regular briefing at 23:08 UTC on 17th August

23:10 UTC Entrance Interval was reduced for sector T09

23:30 UTC CAPA was reduced to 88% in sector T12, 89% in sector T13

¹ Expected Departure Clearance Time (EDCT) is assigned for the flights to certain aerodrome or airspace when air traffic volume is expected to exceed the ATC capacity of the aerodrome or the airspace.

² CAPA is an acronym for the ATC capacity of an aerodrome or an ATC sector.

APPENDIX A to Agenda Item 3.5
APANPIRG/29

23:35 UTC Departure Interval was reduced for sector T12

23:40 UTC EDCT was cancelled for flights heading to RJTT through sector T09

18th August 2015

01:10 UTC Special briefing provided by MET

MET: "Developing CB area in T14 and T09 sectors will move to the northeast or the east-northeast and the peak of the development will continue until around 03 UTC."

MET: "A part of the CBs may spread to sector T12 and T13, but it would not be expected to spread largely to the north. CB clouds in T17 sector will move to the northeast or the east-northeast and spread into T09 sector around 09 UTC, but it will eventually weaken from around 06 UTC."

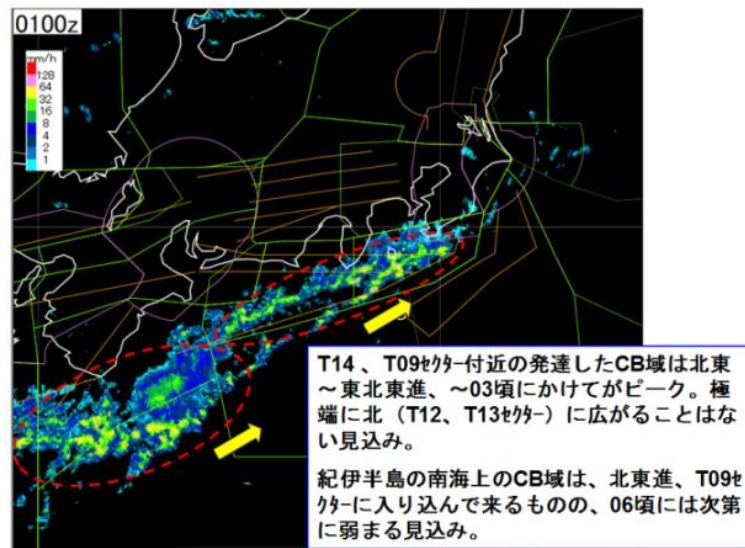


Figure 5 Material for non-regular briefing at 01:10 UTC on 18th August

02:00 UTC Entrance Interval was restored for T09 sector

06:00 UTC Departure Interval was restored for T12 sector

09:30 UTC EDCT was cancelled for flights heading to RJTT from west

3. Summary

In this case, ATM officers shared the latest situation of air traffic flow with MET forecasters and on the other hand, MET forecasters provided special briefings for ATMC with regard to prediction of CB clouds which affected ATC sectors, such as T09 and T14. Additionally, MET forecasters paid attention also to the situation of CB clouds developed in T12 sector, because a number of westbound aircraft departed from RJTT flew into T12 and T13 sectors and, as a result, significant conflicts between eastbound and westbound aircraft were anticipated in those sectors. Based on such interactions, ATMC officers

APPENDIX A to Agenda Item 3.5
APANPIRG/29

appropriately managed air traffic flow with frequent special briefings from MET forecasters.

This case shows how mutual coordination between MET forecasters and ATM officers will improve the efficiency and the safety of air traffic flow under adverse weather conditions.

APANPIRG/29
Appendix B to the Report on Agenda Item 3.5

**Updated terms of reference and work plan of the
METEOROLOGY SUB GROUP (MET SG)**

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 the Asia/Pacific Seamless ATM Plan elements, with due observance to the primacy of air safety, regularity and efficiency using the project management principles where appropriate; and
- c) Review, identify and address specific air navigation deficiencies in the field of that impede the implementation or provision of effective and efficient aeronautical meteorological (MET) services in the Asia and Pacific Regions.

2. Functions of the MET SG Deliverables to meet the Objectives:

~~1) Progress report to be submitted to APANPIRG, addressing the MET SG deliverables (listed in 2 to 9 below);~~

- a) Review MET parts of the APAC ANP to be reviewed and, as necessary, prepare amendment proposals prepared as necessary to update the APAC ANP 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 be monitored and, as necessary, facilitated to support the effective implementation of ASBU priority modules and the Asia/Pacific Seamless ATM Plan elements;
- c) Identify Air navigation deficiencies in the field of aeronautical meteorology MET to be identified (which may require any necessary e.g., through systems performance monitoring to be facilitated) and, where necessary, propose appropriate corrective action proposed and facilitate the development and implementation of action plans by States to resolve identified deficiencies facilitated;
- d) Review and update the APANPIRG list of Air navigation deficiencies in the field of aeronautical meteorology MET (as listed in the APANPIRG database) to be reviewed and, as necessary, updated to reflect the current situation;
- e) Monitor Research and development, and trials and demonstrations in the field of aeronautical meteorology MET and other relevant areas to be monitored and, as necessary, facilitate the transfer of this information and expertise, as necessary, between States facilitated;
- f) Make Specific recommendations to be made, and develop guidance materials developed, aimed at improving aeronautical meteorological services by 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 ~~MET to be reviewed and identified~~ and, as necessary, recommend actions recommended to addressing those issues; and
- h) Identify and progress MET environmental initiatives related to aeronautical meteorology ~~are consistently identified and progressed;~~ and

~~10) Draft Conclusions and Draft Decisions to be formulated relating to matters in the field of MET that come within the scope of the APANPIRG work plan.~~

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 (ICAO, 2016).

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 (ICAO, 2016).

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 (ICAO, 2016).

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 (ICAO, 2016).

7. 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 (ICAO, 2016).

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 (ICAO, 2016).

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 (ICAO, 2016).

9. Work Plan of the MET SG

Function	Detailed description of deliverable	Responsibility	Target date
1, 10	~~Progress report on MET SG deliverables including Draft Conclusions and Draft Decisions relating to matters in the field of MET that come within the scope of the APANPIRG work plan (submitted to APANPIRG/28)~~	MET SG Chair	Aug 2017
a)	Amendment proposal for APAC ANP Volume I and Volume II (submitted to APANPIRG/28)	MET SG Chair, Secretariat	COMPLETED Aug 2017
a)	Draft amendment proposal for APAC ANP to fulfil missing data in Tables MET	MET/S WG	Mar 2019 Jun 2018
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	May 2019 Jun 2018
a)	Amendment proposal for APAC ANP Volume II, Table MET II-2 to reflect current requirements for 30-hour validity TAF (submitted to APANPIRG/28)	MET/S WG (Task 7)	COMPLETED Aug 2017
a), f)	Version 2 of draft regional guidance material for tailored MET information supporting ATM operations	MET/R WG (Task 4)	COMPLETED Jun 2018
b), c)	Analysis of APAC Regional SIGMET test	MET/S WG (Task 1 and 3) MET/IE WG (Task 3)	Mar 2019 Jun 2018
b), c)	Analysis of APAC Regional OPMET-availability monitoring exercise	MET/IE WG (Task 1)	Mar 2019 Jun 2018
b), c)	Analysis of APAC Regional OPMET-timeliness, -compliance and -regularity monitoring exercises	MET/IE WG (Task 2)	Mar 2019 Jun 2018
b), g)	Analysis of APAC Regional VAAC backup tests	MET/IE WG (Task 4)	Mar 2019 Jun 2018
b), g)	Analysis of APAC Regional IROG backup tests	MET/IE WG (Task 5)	Mar 2019 Jun 2018
b)	Revised draft regional guidance material on MET information needed to support the elements of the APAC Seamless ATM Plan	MET/R WG (Task 3)	Jun 2018
c)	Analysis of APAC Regional SIGMET monitoring exercises	MET/S WG (Task 1)	Mar 2019 Jun 2018
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 18/01 (Papua New Guinea)	APAC VOLCEX/SG (Task 5)	TBD Jun 2018
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 18/02 (Indonesia/Sumatra)	APAC VOLCEX/SG (Task 6)	Jun 2019

Function	Detailed description of deliverable	Responsibility	Target date
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 19/01 (Solomon Islands, Tonga or Vanuatu)	APAC VOLCEX/SG (Task 7)	Jun 2019
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 19/02 (North-east Asia/affecting Republic of Korea)	APAC VOLCEX/SG (Task 8)	Jun 2020
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 20/01 (Philippines)	APAC VOLCEX/SG (Task 9)	Jun 2020
c), d)	Proposal to update the APANPIRG AN deficiencies database to add/remove deficiencies in the MET field	MET SG Chair, Secretariat	Aug 2018 ~~Aug 2017~~
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 2019 ~~Mar 2018~~
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)	Jun 2018
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)	Mar 2019 ~~Jun 2018~~
f)	Progress report on implementation and testing of IWXXM exchange	MET/IE WG (Task 5)	Jun 2018
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)	Jun 2018; Mar 2019
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 2018
g)	Analysis of MET information used in the Region specifically to support ATM operations	MET/R WG (Task 2)	Jun 2018
g)	Plan for seminar on regional implementation of MET information to support ATM operations	MET/R WG (Task 5)	Jun 2018
h)	Environmental Issues Identify issues in the field of aeronautical meteorology related to environmental issues	MET SG Chair, Secretariat	Jun 2018
b), e), g)	IWXXM workshop Plan and conduct the IWXXM workshop	Secretariat, MET/IE Chair, MET SG Chair, Hong Kong China, Singapore	Nov 2018
f), g)	SIGMET Guide update Update the Regional SIGMET Guide to align with Annex 3, Amendment 78	MET/S WG (ad-hoc group)	Oct 2018
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	May 2019

APANPIRG/29
Appendix A to the Report on Agenda Item 4

ATM/AIM/SAR Deficiencies List (Updated 05 September 2018)

	Deficiencies			Corrective Action		
States/facilities	Description	Date first reported	Remarks	Executing body	Target date	Priority **
	<u>WGS-84</u> Requirements of Paragraph 3.7.1 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
Cook Islands	WGS-84 - Not implemented	24/6/2014		Cook Islands	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

	Deficiencies			Corrective Action		
States/facilities	Description	Date first reported	Remarks	Executing body	Target date	Priority **
	<u>AIP Format Requirements of Chapter 4 of Annex 15</u>					
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
	<u>AIS Quality Management System Requirements of Paragraph 3.2.1 of Annex 15 Quality Management System - Not implemented</u>					
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

	Deficiencies			Corrective Action		
States/facilities	Description	Date first reported	Remarks	Executing body	Target date	Priority **
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
Cook Islands	AIS Quality Management System - Not implemented	24/6/2014		Cook Islands	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
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

	Deficiencies			Corrective Action		
States/facilities	Description	Date first reported	Remarks	Executing body	Target date	Priority **
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
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
	<u>Airspace Classification Requirements of Paragraph 2.6 of Annex 11</u>					
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 (proposed)	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

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
	ATS Message Addressing Requirements of Doc 4444 PANS-ATM Section 11.4 (Message Types and their Application)		Note: the threshold for a Deficiency is 10 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			
Bangladesh (Proposed)	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
Indonesia	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Indonesia	TBD	A
Malaysia	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Malaysia	TBD	A
Myanmar	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Myanmar	TBD	A
Philippines	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Philippines	TBD	A

	Deficiencies			Corrective Action		
States/facilities	Description	Date first reported	Remarks	Executing body	Target date	Priority **
Republic of Korea	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Republic of Korea	TBD	A
USA	DEP message transmission	05/09/2018	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	USA	TBD	A
	<u>SAR capability: Requirements of Annex 12</u>					
Afghanistan	SAR Capability Matrix	6/07/2015	SAR Capability (no data)	Afghanistan	2016	U
Bhutan	SAR Capability Matrix	6/07/2015	SAR Capability (no data)	Bhutan	2016	U
Cambodia	SAR Capability Matrix	6/07/2015	SAR Capability (14 of 20)	Cambodia	2016	U
Cook Islands	SAR Capability Matrix	6/07/2015	SAR Capability (19 of 20)	Cook Islands	2016	U
Cook Islands	Annex 12 requirements not implemented. No agreements with adjacent States.	31/1/95	Cook Islands - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cook Islands	2009. SAR agreement with New Zealand completed 2007.	U
DPR Korea	SAR Capability Matrix	6/07/2015	SAR Capability (15 of 20 elements non- compliant)	DPR Korea	2016	U

	Deficiencies			Corrective Action		
States/facilities	Description	Date first reported	Remarks	Executing body	Target date	Priority **
Fiji	SAR Capability Matrix	6/07/2015	SAR Capability (13 of 20 elements non- compliant)	Fiji	2016	U
Kiribati	SAR Capability Matrix	6/07/2015	SAR Capability (no data)	Kiribati	2016	U
Lao PDR	SAR Capability Matrix	6/07/2015	SAR Capability (10 of 20 elements non- compliant)	Lao PDR	2016	U
Macau, China	SAR Capability Matrix	6/07/2015	SAR Capability (10 of 20 elements non- compliant)	Macau, China	2016	U
Maldives	SAR Capability Matrix	6/07/2015	SAR Capability (9 of 20 elements non- compliant)	Maldives	2016	U
Marshall Islands	SAR Capability Matrix	6/07/2015	SAR Capability (no data elements non- compliant)	Marshall Islands	2016	U
Micronesia	SAR Capability Matrix	6/07/2015	SAR Capability (20 of 20 elements non- compliant)	Micronesia	2016	U
Myanmar	SAR Capability Matrix	6/07/2015	SAR Capability (17 of 20 elements non- compliant)	Myanmar	2016	U
Nauru	SAR Capability Matrix	6/07/2015	SAR Capability (no data elements non- compliant)	Nauru	2016	U
Nepal	SAR Capability Matrix	6/07/2015	SAR Capability (12 of 20 elements non- compliant)	Nepal	2016	U

	Deficiencies			Corrective Action		
States/facilities	Description	Date first reported	Remarks	Executing body	Target date	Priority **
Palau	SAR Capability Matrix	6/07/2015	SAR Capability (no data)	Palau	2016	U
Papua New Guinea	SAR Capability Matrix	6/07/2015	SAR Capability (11 of 20 elements non-compliant)	Papua New Guinea	2016	U
Philippines	SAR Capability Matrix	6/07/2015	SAR Capability (12 of 20 elements non-compliant)	Philippines	2016	U
Samoa	SAR Capability Matrix	6/07/2015	SAR Capability (no data elements non-compliant)	Samoa	2016	U
Solomon Islands	SAR Capability Matrix	6/07/2015	SAR Capability (no data)	Solomon Islands	2016	U
Timor-Leste	SAR Capability Matrix	6/07/2015	SAR Capability (no data)	Timor-Leste	2016	U
Tonga	SAR Capability Matrix	6/07/2015	SAR Capability (18 of 20 elements non-compliant)	Tonga	2016	U
Vanuatu	SAR Capability Matrix	6/07/2015	SAR Capability (no data)	Vanuatu	2016	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					
Bangladesh (proposed by RASMAG/23)	Annex 11 requirement not implemented	13/07/2017	Conclusion 16/6 – Non Provision of safety related data by States, established by RASMAG/22 – Failure to submit 2016	Bangladesh	RASMAG/23	A

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
			TSD Failure to provide sufficient feedback regarding RVSM approval data			
French Polynesia (proposed by RASMAG/23)	Non-provision of safety related data	05/07/2018	Failure to submit the 2017 TSD	French Polynesia	RASMAG23	A
India	Annex 11 requirement not implemented. Non-provision of safety related data	13/07/2017	Conclusion 16/6 – Non Provision of safety related data by States, established by RASMAG/22 Failure to provide sufficient feedback regarding RVSM approval data Failure to submit RVSM approvals for a large number of aircraft, most of which have also been reported in 2016.	India	RASMAG23	U
Lao PDR (proposed by RASMAG/23)	Annex 11 requirement not implemented. Non-provision of safety related data	13/07/2017	Conclusion 16/6 – Non Provision of safety related data by States, established by RASMAG/22 Failure to submit 2016 TSD Failure to provide RVSM approvals update and RVSM annual snapshot Failure to submit the annual RVSM approval snapshot for 3 consecutive years	Lao PDR	RASMAG23	A
Maldives (proposed by RASMAG/23)	Annex 11 requirement not implemented	13/07/2017	Conclusion 16/6 – Non Provision of safety related data by States, established by RASMAG/22 Failure to submit LHD reports and 2016 TSD	Maldives	RASMAG23	A
Nepal (proposed for	Annex 11 requirement not implemented	05/07/2018	Conclusion 16/6 – Non Provision of	Nepal	TBD	A

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
~~RASMAG/23)~~			~~safety related data by States, established by RASMAG/23~~			
Thailand (proposed for RASMAG/23)	Annex 11 requirement not implemented. Non-provision of safety related data	13/07/2017	Failure to submit the annual RVSM approval snapshot for 2 consecutive years	Thailand	RASMAG23	A
	State Responsibility to comply with the Annex 6 Height-Keeping Monitoring Requirement Annex 6 Part I Section 7.2.79 (10th Ed.) and Part II Section 2.5.2.710 (9th Ed.)					
Afghanistan (proposed by RASMAG/23)	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/23	Remaining monitoring burden of 38% reported in RASMAG/23	Afghanistan	RASMAG24	A
Bangladesh	Non-compliance with LTHM requirement regarding the monitoring burden of more than 50% airframes to be monitored (remaining monitoring burden more than 30%)	RASMAG/22	Remaining monitoring burden of 44% reported in RASMAG/23	Bangladesh	RASMAG24	A
Indonesia (proposed by RASMAG/23)	Non-compliance with LTHM requirement regarding the monitoring burden of more than 50% airframes to be monitored (remaining monitoring burden more than 30%)	RASMAG/23	Remaining monitoring burden of 42% reported in RASMAG/23 Revised number as of August 2018 is 30.1%	Indonesia	RASMAG24	A
Malaysia (proposed by RASMAG/23)	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/23	Remaining monitoring burden of 38% reported in RASMAG/23	Malaysia	RASMAG24	A
Myanmar (proposed by RASMAG/23)	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/23	Remaining monitoring burden of 36% reported in RASMAG/23	Myanmar	RASMAG24	A
Pakistan	Non-compliance with LTHM requirement regarding the monitoring burden of more than 50% airframes to be monitored (remaining monitoring burden more than 30%)	RASMAG/22	Remaining monitoring burden of 69% reported in RASMAG/23	Pakistan	RASMAG24	A

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
The Philippines	Non-compliance with LTHM requirement regarding the monitoring burden of more than 50% airframes to be monitored (remaining monitoring burden more than 30%)	RASMAG/23	Remaining monitoring burden of 30% (30.1%) reported in RASMAG/23	The Philippines	RASMAG24	A
	Data Link Performance Monitoring and Analysis Requirements of Paragraph 2.28 and/or 3.3.5.2 of Annex 11 not met					
Fiji (proposed for RASMAG/23)	Post-implementation monitoring not implemented	25/06/2018	Problem reports not provided to CRA. Performance monitoring and analysis not reported to FIT	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
Indonesia (proposed for RASMAG/23)	Post implementation monitoring not implemented	29/5/2015	Problem Reports not provided to CRA. Performance monitoring and analysis was conducted, but problem reports were not provided to the CRA.	Indonesia	TBD	A
Malaysia (proposed by RASMAG/23)	Post-implementation monitoring not implemented	29/5/2015	Problem Reports not provided to CRA. Performance monitoring and analysis not reported to FIT.	Malaysia	TBD	A
Myanmar (proposed by RASMAG/23)	Post-implementation monitoring not implemented	29/5/2015	Problem Reports not provided to CRA. Performance monitoring and analysis not reported to FIT.	Myanmar	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
Sri Lanka (proposed by RASMAG/23)	Post implementation monitoring not implemented	29/5/2015	Problem Reports not provided to CRA. Problem reports were not provided to CRA, performance monitoring and analysis was not reported to FIT, but Sri Lanka was	Sri Lanka	Post Implementation Monitoring partially implemented.	A

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
			now registered with a competent CRA. Agreed by FIT Asia/5-6, endorsed by RASMAG/21-22		Data Link Reporting based on the SITA AIRCOM ATS-622 Traffic & Performance Report will be submitted on monthly basis from Sept 2017 onward. Data Link Performance Reports will be submitted to FIT with effect from Feb 2018. (Target date) (APANPIRG/28)	
Viet Nam (proposed by RASMAG/23)	Post-implementation monitoring not implemented	29/5/2015	Performance monitoring and analysis not reported to FIT.	Viet Nam	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.

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Nepal Kathmandu 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	U
				Insufficient runway strip, refer recommendations given in section 3.4 of Annex 14, Volume I.	Provide runway strip as per ICAO recommendations			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	Maldives	Runway/ Taxiways	AGA Mission Report April 2008	Insufficient runway strip.	Runway strip available	Maldives Airports Company Pvt. Ltd	Runway strip of 150m for both sides is available	U
	Male International Airport Velana International Airport						Apron is still within the runway strip. New master plan work is in progress, new runway construction on-going, estimated date of completion: December 2018. Exemption granted by the State to Aerodrome Operator till December 2018. Runway strip of 150m for both sides is available Apron is still within the runway strip. New master plan work is in progress, new runway construction on-going, estimated date of completion: December 2018. Exemption granted by the State to Aerodrome Operator till December 2018.	

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
				Provision of RESA in accordance with section 3.5 of ICAO Annex 14, Volume I. CLOSED by APANPIRG/29	RESA will be provided	Maldives Airports Company Pvt. Ltd	RESA available for RWY36 end-240m RESA available for RWY18 end-55m These figures have been published in the AIP Exemption granted by the State to Aerodrome Operator till December 2018. RESA available for RWY36 end- 240m RESA available for RWY18 end- 90m Revision to declared distances have been published in the AIP Supplement 02/18 date of issue: 15 March 2018. Exemption granted by the State to Aerodrome Operator till December 2018. CLOSED	U

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	India Chennai International Airport	Runway	AGA mission January 2009	RESA not provided in accordance with Para 3.5 of Annex 14, Volume I requirements; [CLOSED by APANPIRG/29]	RESA will be provided	AAI	~~December 2012~~ RESA provided, however desired strength is yet to be provided. RESA provided. [CLOSED]	U
				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.	300m strip width for full length of runway 07/25 will be made available.	AAI	~~December 2013~~ Action initiated Work in progress. 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	RESA not provided for R/W 09 and R/W 14 in accordance with Para 3.5 of ICAO Annex 14, Volume I; [CLOSED by APANPIRG/29]	RESA will be provided	MAIAL	R/w 09 RESA provided R/w 14 June 2013 RESA provided. [CLOSED]	U

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
				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	300m strip width for full length of runway 09/27 will be made available	MIAL	~~R/w 09/27 – August 2013~~ ~~R/w 14/32 – June 2013~~ 31 Dec 2020. Due to presence of slum in beginning of RWY 09/27 south – RWY strip 300m not available. Due to presence of slum of either side at beginning of RWY 14/32 – RWY strip 300m not available.	A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Cambodia Siem Reap International Airport	Runway	AGA mission of March 2009	RESA not provided as per Para 3.5 of Annex 14, Volume I.; [CLOSED by APANPIRG/29]	RESA will be provided		RESA provided. RESA improvement plan under consideration to satisfy Para's 3.5.87 to 3.5.10 of Annex 14. RESA provided at both ends of the Runway (runway 05/23) Dimension 90 m x 140 m [CLOSED]	U

APANPIRG/29 – WP/15

Appendix 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	Bangladesh Hazrat Shahjalal International Airport, Dhaka	Runway/ Taxiway	ICAO mission April 2009	Runway strip width insufficient(300m 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 300m 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

APANPIRG/29 – WP/15

Appendix 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	Thailand	Runway	AGA mission of July 2009	RESA to satisfy Section 3.5 of Annex 14, Volume I requirements;	RESA will be provided		Risk assessment study in process (DCA letter dated 9 April 2014) The Runway End Safety Area will be provided at Phuket International Airport to satisfy Section 3.5 of Annex 14, Volume I requirements. The contractor procurement is in progress. The construction is expected to be completed in 2020.	U
				Runway strip width insufficient (300m runway strip for precision approach runways in accordance with Para 3.4.5 of Annex 14, Volume I;	300m runway strip width for full length of runway will be made available		Risk assessment study in process (DCA letter dated 9 April 2014) Phuket International Airport has corrected the Air Navigation Deficiencies in AOP field by completing the risk assessment study regarding the runway strips deficiency, and DCA has already approved the risk assessment study since December 2014.	A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Myanmar Yangon International Airport	Runway/ Taxiway	ICAO mission April 2010	Runway shoulder higher than adjacent strip	Flush strip with adjacent runway shoulder	Department of Civil Aviation	~~October 2011~~ 30 Nov 2018 (Risk Assessment conducted by the operator on 21 May 2018)	A
				Provision of enhanced taxiway centre line marking in accordance with standard in Para 5.2.8.11 of Annex 14, Volume I.	enhanced taxiway markings will be provided		~~DCA SMGCS. The system will start in 2012has planned to implement~~ 20 November 2018	A
				Provision of RESA in accordance with Section 3.5 of Annex 14, Volume I requirements;	RESA will be provided		~~March 2011~~ 30 Dec. 2018 Risk Assessment conducted by the operator on 10 Aug 2018.)	A
				Provisions of shoulders for taxiways	taxiway shoulders will be provided		~~Beginning of 2012~~ 30 Nov. 2018	B
				Provision of road holding position signs at entrances to active runways	road holding position signs will be provided		~~October 2011~~ 30 Dec. 2018	A
		Bird Hazard		Establishment of a national bird committee in accordance with APANPIRG Conclusion 18/1.	Establish National Bird Committee		~~DCA will establish National Bird committee.~~ 31 March 2019 (Guideline for Wildlife Control is being developed and will be published on 30 Sep 2018)	B

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Mandalay Airport	Runway/Taxiway	April 2010	Provision of RESA in accordance with Section 3.5 of Annex 14, Volume I requirements;	RESA will be provided	Department of Civil Aviation	~~Oct 2011~~ 31 Dec 2019 (Risk Assessment is being conducted by the operator)	A
				Provision of enhanced taxiway centre line marking in accordance with standard in Para 5.2.8.11 of Annex 14, Volume I. (CLOSED by APANPIRG/29)	enhanced taxiway markings will be provided		DCA is reviewing the requirement for taxiway enhanced centerline marking Completed on 13 April 2018 CLOSED	A
				Provision of road holding position signs at entrances to active runways.	road holding position signs will be provided.		~~Oct 2011~~ Completed on 7 Aug 2018	A
Annex 14 Vol. I Amendment 6 § 10.1 § 10.2				A maintenance programme should be established to maintain facilities in a condition which does not impair safety of air navigation. (CLOSED by APANPIRG/29)	DCA establishes and implements procedures to aerodrome operators meet national requirements for maintenance programme.		~~End of 2011~~ A maintenance programme for Electrical & Visual Aids completed on 01 Dec 2016 and for Pavement on 01-Jan2017. CLOSED	A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
	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		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 is being developed by the Aerodrome Operator requesting issuance of an Exemption until RESA is able to be provided. ~~Target date 4th Quarter 2025~~ 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 - 2020	A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
				Establishment of a national bird committee in accordance with APANPIRG Conclusion 18/1. (CLOSED by APANPIRG/29)	Established National Bird Committee		ACTION TAKEN (PARTIALLY COMPLETED): Wildlife Committees (membership includes Aerodrome Operators, CAA, Airline representatives and other industry stakeholders) have been established for each the two International Airports and meet on a monthly basis. A National Wildlife Committee which will bring together both committees will be established before the end of 2017. Target date 4th Quarter 2017 Wildlife Committees established for both international airports. Membership includes aerodrome operators, CAA Fiji, airline representatives and other industry stakeholders (CLOSED)	B

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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		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 is being developed by the Aerodrome Operator requesting issuance of an Exemption until RESA is able to be provided. Land has been acquired and work is due to commence 4th quarter 2017.~~ ~~Target date 4th Quarter 2018~~ 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 - 2020	A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Sri Lanka Bandaranaike International Airport	Runway/ Taxiway	ICAO mission April 2010	Provision of 300m 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 and flush strip with adjacent runway shoulder	CAASL	Safety study for the deficiency will be completed and submitted by August 2017. 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
				Provision of runway hold position lights in accordance with Para 5.3.19 of ICAO Annex 14, Volume I CLOSED by APANPIRG/291	runway hold position lights will be provided		The stop bars will be provided in association with SMGCS at all A,B,C,D & E TWYs. The location will be 120m from RWY centre line for TWY A & E whereas 90m for TWY B,C & D. The target date of operation is JULY 2017. Runway Holding Position Stop Bar Lights have been installed with effect from 31/07/2017 and after the provision of training to ATCOs the operations of these lights have been commissioned with the issuance of the applicable SOP dated 02nd April 2018. CLOSED	A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
				Establishment of a national bird committee in accordance with APANPIRG Conclusion 18/1.	National Bird Committee will be established		~~TOR for National Bird committee is being drafted. The committee will be convened by August 2017.~~ 1 st Draft of TOR of National Bird Control Committee of Sri Lanka has been compiled and ready for ratification.	A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
	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.		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
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		December 2018 At present, Tan Son Nhat Intl airport is re-designed for upgrading the runways and setting up the RESA.	A

APANPIRG/29

Appendix B to the Report on Agenda Item 4

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**
				Wildlife strike report submission to ICAO for inclusion in IBIS.	Submission of wildlife strike reports to ICAO for inclusion in IBIS.		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

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Brunei Darussalam Brunei International Airport	Runway	ICAO Mission of April 2011	vegetation along pavement edges and strip higher than the adjacent runway pavement; uneven earth mounds on strip				A
				faded centre line and other markings;				A
		Taxiway		non provision of enhanced taxiway centre line marking in accordance with Para 5.2.8 of Annex 14, Volume I				A
				Objects on taxiway strips; vegetation on pavement joints and maintenance of joints				A
		Apron		non provision of ICAO compliant signage in accordance with section 5.4 Annex 14, Volume I				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;				A
				non provision of road holding position sign at all road entrances to a runway; and				A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
		Wildlife Hazards:		Establishing a national bird control committee in accordance with APANPIRG Conclusion 18/1;				B

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Lao PDR Wattay International Airport	Runway	ICAO Mission of March 2011	Non provision of RESA in accordance with section 3.5 of Annex 14, Volume I				U
				rubber deposits and faded centre line markings.				A
		Taxiway		Provision of runway hold position lights in accordance with Para 5.3.19 of ICAO Annex 14, Volume I				A
				Provision of enhanced taxiway centre line marking in accordance with Para 5.2.8 of Annex 14, Volume I				
		Rescue and Fire Fighting (RFF):		Provision of road holding position sign at all road entrances to a runway;				A
		Wildlife Hazards:		Establishing a national bird control committee in accordance with APANPIRG conclusion 18/1.				B

APANPIRG/29**Appendix B** to the Report on Agenda Item 4**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**
	Luang Prabang International Airport	Runway		Provision of enhanced taxiway centre line marking in accordance with standard in Para 5.2.8.11 of Annex 14, Volume I				A
		Taxiway		Provision of runway hold position lights in accordance with Para 5.3.19 of ICAO Annex 14, Volume I on new taxiways				A
		Rescue and Fire Fighting (RFF)		Provision of road holding position sign at all road entrances to a runway				A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Mongolia Ulaan Baatar International Airport	Runway	ICAO Mission of July 2011	rubber deposits and faded centre line and other faded markings;				A
		Taxiway		Resealing cracks on pavement surface with sealants to prevent ingress of water and broken edges which could cause FOD issues.				A
				Provision of enhanced taxiway centre line marking in accordance with Para 5.2.8 of Annex 14, Volume I.				A
				faded taxiway markings				A
				Maintenance of pavement cracks				A
				provision of runway hold position lights in accordance with Para 5.3.19 of ICAO Annex 14, Volume I .				A

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
				provision of taxiway hold position signs on all hangar taxiways at entrances to the active taxiways/runway.				A
		Apron		sealing the cracks on the apron surface				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.				A
		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;				B B

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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	Tonga							
	Fua'amotu International Airport	Runway Strip	ICAO Mission of Sept. 2015	Insufficient Runway Strip				A
Annex 14 Volume I	Solomon Islands	Runway Strip	ICAO Mission of Oct. 2015	Insufficient Runway Strip				A
	Honiara International Airport/Henders on Field							
		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	Samoa	Runway Strip	ICAO Mission of Oct. 2015	Insufficient Runway Strip				A
	Faleolo International Airport							

APANPIRG/29
Appendix B to the Report on Agenda Item 4

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**
		Aerodrome Pavements		Lack of maintenance of aerodrome pavements in accordance with Annex 14, 10.2				U

* 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.

APANPIRG/29
Appendix C to the Report on Agenda Item 4

(Updated July 2018)

APANPIRG/29 – WP/15
Appendix C

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
Adequate and reliable VHF COM	Myanmar	Quality and reliability of RCAG VHF inadequate and unavailability of required coverage.	1998	Improvements in the quality of link to RCAG stations and power supply system at some remote stations are required.	An action plan was developed to upgrade equipment at RCAG stations, replace VSAT stations at 5 VSAT location for the relay link to RCAG sites, to improve power supply system. Additional VSAT RCAG station was installed at Coco Island in 2017.	DCA Myanmar	December 2017	A
		Improvements had been observed with occasional communication problems reported.	June 2011		From 26 May 16, DCA Myanmar started using 4 VHF channel for 4 ACC sectors covering Yangon FIR.		Completed in June 2018	
		From 2 to 13 April 2012, a survey was conducted by IATA. 50 reported no communication had been established.	April 2012		Further improvements at Sittwe and Pathin will be made by the DCA in August 2017.			
		Survey on 8 July 2016 indicated that overall 94% (514 flights) of aircraft successfully established communications of one form or another with Yangon ATC. Of the 548 responses, 6% (34 flights) could not establish communications with ATC at the FIR boundaries.	July 2016		DCA was requested to keep ICAO APAC Office informed for coordination with IATA for the next survey.			
		In Flight Broadcast Procedure (IFBP) currently still in place			Further improvement made in 2017, letter for removal of this deficiency was received from DCA. Myanmar on 22 June 2018			

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)	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 COM coordination meeting – Afghanistan and Pakistan was held in June 2012 in Karachi, Pakistan. Further follow-up was made in end of 2014 and early 2015. A Remedial action plan was updated. New proposal for using landline has also proposed to be established between two States.	In March 2012, initial discussion on improvement of AFS communication was held at a special ATS coordination meeting. The COM coordination meeting in June 2012 developed a remedial action plan which was further updated in February 2015. 1. Near-term by end of September 2012, fully utilize the VPN circuit operational since January 2012 for exchange of AFTN traffic, organize users' training if required; (status quo) 2. Mid-term, harmonize VSAT terminal equipment and select common network service provider to recover the VSAT Links; Afghanistan has successfully changed the service provider in February 2015. 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. 3. Long-term: establish a dedicated landline connection with multiplexers between Afghanistan and Pakistan to support both data and voice communication between COM centres and ACCs	Ministry of Transport and Civil Aviation Afghanistan and CAA. Pakistan	December 2018	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 – FASID Table CNS 1D	Pakistan & China	Improvement of ATS Direct Speech circuit performance and A/G communication and surveillance coverage between China and Pakistan	May 2014 RASMAG/19	The ATS direct speech circuit via IDD between Urumqi and Lahore was observed not stable. Issues reported were in 2013. In early 2017, a hotline connection changing to a new service provider at Pakistan side has been established. Some improvement has been achieved. Further efforts are required based on RASMAG report.	Remedial action plan was developed in May 2015 by both States through a COM coordination meeting. A VSAT is planned to be installed at Lahore for connection with Urumqi ACC and additional VHF station is required to be installed to cover the VHF gap at PURPA crossing point. Technical survey for VSAT site in Lahore was done in January 2016. Agreement for installation and operation being discussed by two States. MoU for equipment transfer and installation was discussed. Both States were urged to expedite implementation through actions in follow up agreement at COM coordination meeting.	China ATMB and CAA. Pakistan	December 2018	A

APANPIRG/29
Appendix D to the Report on Agenda Item 4

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 information for operators and flight crew members, including forecasts provided by the WAFCs (Annex 3: Chapter 9)	Cambodia (AP-MET-09)	Briefing and flight documentation not provided as required; WAFC forecasts not available	1999	Airlines do not receive the required flight documentation, including WAFC forecasts	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. APANPIRG decided to remove the deficiency from the open list – See notes below for more information.	SSCA, Cambodia	TBC	A
MWO and SIGMET service (Annex 3: Chapter 3, 3.4 and Chapter 7)	Cambodia (AP-MET-11)	Requirements for MWO and SIGMET service not established for Phnom Penh FIR	1992	MWO not established due to lack of trained personnel and technical facilities	Establish MWO to provide required service, including SIGMET information for Phnom Penh FIR. APANPIRG decided to remove the deficiency from the open list – See notes below for more information.	SSCA, Cambodia	TBC	A
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

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 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
Provision of SIGMET information (Annex 3: Chapter 7)	Lao People's Democratic Republic (AP-MET-12)	Requirements for issuance and dissemination of SIGMET information for Vientiane FIR have not been fully implemented	2000	SIGMET frequently not available; as reported by airlines	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. APANPIRG decided to remove the deficiency from the open list – 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)	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
Provision of SIGMET for volcanic ash (Annex 3: Chapter 7)	Philippines (AP-MET-07)	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.	PAGASA	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. See notes below for more information.	Solomon Is. MET Service	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 *
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
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

Index No.	Date	NOTES
AP-MET-01	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.
AP-MET-02	September 2017	APANPIRG/28 noted that Kiribati should: • Verify the status of implementation of CAP; and

Index No.	Date	NOTES
		Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the deficiency.
AP-MET-03	September 2017	Removed from the open list, APANPIRG/28 Conclusion 28/29 refers.
AP-MET-04	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-05	–	This Index No. is not used.
AP-MET-06	September 2017	Removed from the open list, APANPIRG/28 Conclusion 28/29 refers.
AP-MET-07	6 June 2016	PAGASA/CAAP advised that: - Procedures implemented (Ref: PM-WD-AMSS-05-05) for the issuance of SIGMET information (for volcanic ash) for Manila FIR by the designated MWO in accordance with the ICAO SARPs; - Conducted ICAO volcanic ash exercises and participated in the ICAO APAC Volcanic ash exercises steering group (VOLCEX/SG); - Participated in the ICAO Regional SIGMET tests (without errors in SIGMET test messages sent by Philippines); - Procedures implemented as set forth in the Philippine Regulation, <i>CAR-ANS Part 3 – Aeronautical Meteorological Service</i>, including other related national documents; and - Tripartite agreement established between CAAP, PAGASA and PHIVOLCS stipulating the flow of volcanic ash information between the stakeholder agencies.
	30 June 2016	CAAP advised that: In addition to the information provided above, and in view of the adherence to national procedures, regulations and other documents supporting the implementation of ICAO Annex 3 SARPs, CAAP requests ICAO to remove the deficiency from the open list.
	September 2017	APANPIRG/28 noted that: Removal of the deficiency from the open list is subject to the concurrence of the airlines and VAACs that the deficiency is resolved.
	June 2018	MET SG/22 noted that: VAAC Tokyo was coordinating with Philippines on the validation of corrective action taken to resolve the deficiency.
AP-MET-08	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-09	18 August 2016	State Secretariat of Civil Aviation of Cambodia advised that: Equipment installed at the following aerodromes: Phnom Penh (VDPP), Siem Reap (VDSR) and Sihanouk (VDSV), to obtain the digital forecasts provided by the WAFCS, via the Secure Aviation Data Information Service (SADIS), with full operational status at the end of

Index No.	Date	NOTES
		2013; and Personnel trained to use the above systems to generate the required forecasts for operators and flight-crew members.
	September 2017	APANPIRG/28 noted that Cambodia 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 2018	MET SG/22 considered that: - The corrective actions implemented by Cambodia, including the implementation of SADIS reception facilities and associated training of relevant meteorological personnel validates rectification of the deficiency; and - APANPIRG should remove the deficiency from the open list.
	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	18 August 2016	State Secretariat of Civil Aviation of Cambodia advised that: Arrangements made for another Contracting State (China) to provide SIGMET service on behalf of Cambodia for the Phnom Penh FIR (as informed by State Secretariat of Civil Aviation of Cambodia, 18 August 2016).
	September 2017	APANPIRG/28 noted that Cambodia 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 2018	MET SG/22 considered that: - The corrective actions implemented by Cambodia, including the provision of SIGMET service by China on behalf of Cambodia, since 2010, validates rectification of the deficiency; and - APANPIRG should remove the deficiency from the open list.
	September 2018	Removed from the open list, APANPIRG/29 Decision 29/23 refers
AP-MET-12	September 2017	APANPIRG/28 noted that Lao PDR 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 2018	MET SG/22 considered that: The corrective action implemented by Lao PDR, including the establishment of agreements by relevant authorities, implementation of procedures for SIGMET issuance, training of personnel for SIGMET preparation, participation in ICAO APAC SIGMET tests and exercises and the issuance of SIGMET information in accordance with Annex 3, validates rectification of the deficiency; and

Index No.	Date	NOTES
		• APANPIRG should remove the deficiency from the open list.
	September 2018	Removed from the open list, APANPIRG/29 Decision 29/24 refers
AP-MET-13	–	This Index No. is not used.
AP-MET-14	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-15	–	This Index No. is not used.
AP-MET-16	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	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 (MOI) 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	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.
AP-MET-19	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.	Date	NOTES
AP-MET-20	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.
AP-MET-21	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	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	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.
AP-MET-24	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.

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

Acronyms/Abbreviations/Definitions

MET	— Meteorological
METAR	— Aerodrome routine meteorological report (<i>in meteorological code</i>)
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 (<i>in meteorological code</i>)
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

APANPIRG/29
Appendix A to the Report on Agenda Item 6

Improving State's engagement in Regional air navigation planning and implementation

APANPIRG Workshop, Wednesday 05 September 2018

The success of APANPIRG in meeting its objectives to support air navigation planning and implementation in the APAC Regions depends on effective interactions between APAC States and Administrations and the various mechanisms used within the Regions for the purpose of Air Navigation Services infrastructure improvement.

To promote effective engagement of States in Regional air navigation planning and implementation, and ultimately the ongoing success of the APANPIRG program, the ICAO Secretariat will take the opportunity during APANPIRG/29 to facilitate a workshop for APANPIRG participants to address two main issues: 1) State Response Effectiveness, and 2) Implementation Issues.

The objective of the workshop will be for the participants to formulate proposals for actions by States, which address the issues discussed in the workshop. The workshop's rapporteurs will present the proposals to the plenary session for review and possible adoption as APANPIRG/29 Conclusions.

At the start of the workshop, the Secretariat will invite the meeting to break into two groups and designate each of the two "Breakout Groups" to address one of the two main issues as follows:

1. Firstly, discuss the objective of the workshop, sensitize participants about the designated main issue – which the group will address via three key discussion points – and generate various ideas for improvement;
2. Then, split into three sub-groups, and designate three rapporteurs (from Member States), to discuss in detail each of the three key discussion points and the associated ideas for improvement and to develop proposals for actions by States, accordingly;
3. Using a PowerPoint template provided, each of the three sub-group rapporteurs will then present a summary of the discussion outcomes for further review by the Breakout Group as a whole; and
4. Finally, the three rapporteurs will consolidate the Breakout Group outcomes into a single presentation for the APANPIRG plenary session (approx. 15 minutes each).

Breakout Group 1: State Response Effectiveness

Location: Meeting Room 1

Facilitators: ICAO Secretariat

Participants: maximum of two (2) per APANPIRG delegation ONLY

Breakout Group 1 will address the effectiveness of States' responses to APANPIRG outcomes through three key discussion points:

- i. Responses to ICAO State letters
 - The ICAO USOAP emphasises that States do not always fulfil their responsibilities to efficiently receive, assess and take action in response to ICAO State letters.

- Unless provided directly by ICAO, the appropriate technical experts in States do not always receive the State letters through their State's official communication channels (e.g., ICAO State letter focal point).
- In some cases, systems such as SIMS and SOMS would facilitate States' responsiveness to ICAO State letters, but there might be a need to consider other ways of improving systems in this area.
 - Key question: how can we improve the management of formal ICAO correspondence?
 - Possible success factor: administrative systems.

ii. Responses to ICAO technical questionnaires and Reporting Systems

- ICAO issues many State letters requesting feedback from States to assist with global and regional planning.
- ICAO is increasingly developing Internet-based reporting systems, such as the Seamless ATM portal, but these are sometimes costly and time-consuming to implement.
- State's responses do not always fulfil the requirements of these questionnaires and reporting systems, either through lack of proper coordination with the appropriate technical experts, lack of responses in any form from States or for other reasons.
- Incomplete or no feedback from a State makes it difficult for ICAO to identify significant implementation problems in that State.
 - Key question: how can we improve the accuracy and number of responses to ICAO questionnaires and reporting systems?
 - Possible success factor: more support from States to build Internet-based systems for ease of technical feedback.

iii. Attendance at APANPIRG and its Contributing Bodies, and Meeting Interaction

- For many years, a number of States have not regularly attended meetings, due to lack of qualified personnel or cost or other reasons.
- However, States that do not send representatives to the APANPIRG forum/s might be the ones that would benefit most from such interaction.
- States would benefit most by submitting properly coordinated discussion papers, aligned with the scope of APANPIRG discussion on political or [adverse] economic/environmental aspects.
 - Key question: how can we improve participation at meetings and the quality of State contributions to regional policy-making?
 - Possible success factor: longer term planning and preparation by States before meetings, and use of electronic systems for better awareness of meeting outcomes.

Breakout Group 2: Implementation Issues

Location: Conference Hall

Facilitators: ICAO Secretariat

Participants: open to all APANPIRG participants excluding Breakout Group 1

Breakout Group 2 will address States' engagement in air-navigation-systems implementation through three key discussion points:

i. APANPIRG Deficiencies

- APANPIRG's objectives include identifying and addressing specific deficiencies in the air navigation field, however discussion about deficiencies in the APANPIRG forum has often been limited.
- ICAO, States and (air navigation) users should all coordinate to identify and address APANPIRG Deficiencies.
- APANPIRG has urged States/Administrations to establish action plans, update the status on the corrective action taken and to designate focal points to coordinate the resolution of deficiencies, but progress has remained slow.
 - Key questions: how can we accurately identify the number of Deficiencies that are being actively worked on and progress reported to APANPIRG? How can assistance be provided to States on developing and implementing Corrective Action Plans to resolve deficiencies?
 - Possible success factor: greater public visibility of Deficiencies – especially long term Deficiencies - to senior decision-makers.

ii. Regional Planning

- Despite numerous APANPIRG Conclusions and DGCA Action Items, implementation progress has not met targets, including the ten priority elements agreed by APANPIRG.
- For some elements such as route design and ATFM elements, lack of implementation progress is especially evident with the regional policy agreed in the Asia/Pacific Seamless ATM Plan and subsidiary plans such as the ATFM Framework.
- The Beijing Ministerial Declaration adds another layer to the regionally agreed policies on infrastructure harmonization and interoperability, however better visibility of the progress towards such commitments may be required.
 - Key question: how can we improve the poor progress of implementation of regionally agreed infrastructure plans?
 - Possible success factor: greater public visibility of commitments and improved understanding by senior decision-makers of regional policy.

iii. Identifying Implementations Gaps and Potential Resources

- The Regional Office discussed development of a systematic needs-capability matching mechanism referred to as ADAPT (Asia/Pacific Development and Planning Tool), to identify, on a regional basis, possible solutions and to track those solutions

on a project management basis. However, resources would be needed to develop ADAPT processes and Tool.

- Given that the APAC Region has vast capability across its diverse States and administrations in terms of finance, tools, templates, expert personnel (including recently retired volunteers) and systems, most solutions could be identified and managed within the Region.
 - Key question: how can we find ways of better using our resources and capabilities to help with identified implementation gaps?
 - Possible success factor: electronic systems facilitating systematic project management that draw on regional and external resources, with associated procedures to ensure the optimum coordination required.

Note: COSCAP-South Asia has already developed a software tool named ASRTM that offers a manual capability for matching capabilities and needs. However, this tool, if suitable, would need to be modified to suit regional application, with ability to code needs and capability, retain confidentiality of some sensitive information, track milestone achievements and report to the Region, and if possible, the public.

APANPIRG/29

Workshop Group 1

State Response Effectiveness

Report to the Meeting

Breakout Group 1

- Sub-Group 1
 - *State Response Effectiveness*
- Sub-Group 2
 - *Responses to ICAO technical questionnaires and reporting systems*
- Sub-Group 3
 - *Attendance at APANPIRG and its Contributing Bodies, and meeting interaction*

Sub-Group 1/1

State Response Effectiveness

Sub-Group 1/1

State Response Effectiveness - Issues

I-1/1: ICAO State letters often not getting timely response or no response. (Receive, Assess and Take Action).

I-2/2: Unless provided directly by ICAO , technical experts in States do not receive information from State's official communication channels.

Sub-Group 1/1

State Response Effectiveness - recommendation

R-1/1: Every country / CAA / organization to have a Focal Point to respond to ICAO State letters

R-1/2: Information on Focal Point to be updated. Focal Point to be competent office and sensitized to importance of timely response to ICAO State letters. Focal Point to be at least general technically qualified to deal with the subject. States which are frequently not responding be guided by APAC / bilaterally.

R-1/3 Process control for systematic tracking and management of ICAO State letters within State and APAC.

Sub-Group 1/1

State Response Effectiveness - recommendation

R-1/4: Need for increasing awareness of State responsibility regarding importance of Regional programmes as related to ICAO HQ.

R-1/5: APAC to display on its site a list of letters sent, response received and awaited.

Sub-Group 1/2

*Responses to ICAO technical
questionnaires and reporting systems*

Sub-Group 1/2

Responses to ICAO technical questionnaires and reporting systems

I-2/1: On focal point

R-2/1: To have Alternate focal point

Sub-Group 1/2

Responses to ICAO technical questionnaires and reporting systems

I-2/2: Information on ICAO Tools (Seamless ATM portal etc.)

R-2/2 :

- (i) To Improve State System by Required focal point/Alternate focal point
- (ii) ICAO to improve the tools to disseminate the automatic response feedback

Sub-Group 1/2

Responses to ICAO technical questionnaires and reporting systems

I-2/3: Delay/No response on Questionnaires.

R-2/3: State to identify additional focal points from Industry for better reporting/response.

Sub-Group 1/2

Responses to ICAO technical questionnaires and reporting systems

I-2/4: Lack of Expertise on New Subject Matters.

R-2/4: Refer to RSOO/COSCAP/ tele-conferences with ICAO.

Sub-Group 1/2

Responses to ICAO technical questionnaires and reporting systems

I-2/5: Lack of Multilateral Co-ordination among Neighboring State

R-2/5: ICAO should promote side meetings to address multilateral issues among the states for speedy response.

Sub-Group 1/3

Attendance at APANPIRG and its Contributing Bodies, and meeting interaction

Sub-Group 1/3

*Attendance at APANPIRG and its contributing bodies,
and meeting interaction*

I-3/1: Visa/Logistics issues

R-3/1: ICAO RO to host meetings at Bangkok as far as practicable. If hosted in another country, Invitation letter should be sent earlier than 2 months (for facilitating VISA process) and ICAO could follow up with a reminder.

Sub-Group 1/3

*Attendance at APANPIRG and its contributing bodies,
and meeting interaction*

I-3/2: lack of awareness on importance of attendance/participation by States

R-3/2: ICAO to put participation status of states as an agenda item in the DGCA (APANPRIG and contributing bodies) – Highlight absentee list

Sub-Group 1/3

*Attendance at APANPIRG and its contributing bodies,
and meeting interaction*

I-3/3: Lack of attendance and participation of attendees

R-3/3: ICAO to consider requiring all member states to make presentation on identified Deficiencies at the APANPRIG/SG meeting

Sub-Group 1/3

*Attendance at APANPIRG and its contributing bodies,
and meeting interaction*

I-4/4 : Limited resources /Technical expertise

R-4/4: Facilitate alternative means to
attend/participate [Webiner, Online broadcast]

Sub-Group 1/3

*Attendance at APANPIRG and its contributing bodies,
and meeting interaction*

I-3/5 : Lack of active Participation at the forums

R-3/5: More breakout sessions for participations
(workshops)

APANPRIG/29/XX/Suggested Conclusions

- That, states and administrations to review and implement a focal point system for **receipt, dissemination and response** to ICAO correspondences with consideration on:
 - a) Process control for systematic tracking and management of ICAO State letters within State and APAC;
 - b) Additional focal point support as necessary;
 - c) Nomination of competent focal point with necessary training.

APANPRIG/29/XX/Suggested Conclusions

States to prepare and update the APANPRIG/SG on the status of their Corrective action to identified Deficiencies at APANPIRG/SG.

APANPIRG/29

Workshop Breakout Group 2

Implementation Issues

Report to the Meeting

Group 2 Sub-Groups

- Sub-Group 1
 - *APANPIRG Deficiencies*
- Sub-Group 2
 - *Regional Planning*
- Sub-Group 3
 - *Identifying Implementation Gaps and Potential Resources*

Sub-Group 2/1

APANPIRG Deficiencies - Issues

- **COMMUNICATIONS**

- State
 - Internal follow-up with other agencies
 - Failure to respond to State Letters notifying deficiencies
- APAC Region
 - Identification of priorities for addressing deficiencies

Sub-Group 2/1

APANPIRG Deficiencies - Issues

- **CONTROL**

- Deficiency is not within ANSP or Regulator control to address
- External factors constraining resolution
- Geo-politics hindering progress, authority of ICAO to influence outcomes

Sub-Group 2/1

APANPIRG Deficiencies - Issues

- **ADMINISTRATION**

- Status of long-term deficiencies
- Mechanism for escalation of issues
- Presentation/format of deficiency information
- Vehicle for States to record activity initiation and deficiency resolution

Sub-Group 2/1

APANPIRG Deficiencies - Issues

- **RESOURCES**

- Inability to attend PIRG/Sub-Group/Technical group meetings
- Access to resources to address deficiencies

Sub-Group 2/1

APANPIRG Deficiencies- Recommendations

- **COMMUNICATIONS**

- State – (and ICAO?) to nominate points of contact for deficiencies, including expectations, qualifications, competencies
- State – improved awareness of other agencies within the State of the ICAO/PIRG role (education of all stakeholders)
- ICAO – improved presentation of deficiency information – more detail/context – possibly technology solution.

Sub-Group 2/1 *APANPIRG Deficiencies- Recommendations*

- **CONTROL**
- Incorporated under other themes (education)

Sub-Group 2/1

APANPIRG Deficiencies- Recommendations

- **ADMINISTRATION**

- APANPIRG - Identify priority list/deficiency area
- ICAO/Sub-Groups/Working Groups – Locate Sub-Group and/or technical group meetings in geographical areas of particular deficiency interest
- State – provide more info on:
 - Reason for lack of progress
 - Reason for non-reporting
 - Internal priorities related to deficiency resolution

Sub-Group 2/1

APANPIRG Deficiencies- Recommendations

- **RESOURCES**

- Identify or better achieving States to buddy-up or act as change champions

Sub-Group 2/1
*PROPOSED APANPIRG
CONCLUSIONS/DECISIONS/RECOMMENDATIONS*

Draft Conclusion APANPIRG/29-X

That, States are urged to

1. nominate a point of contact (POC) for coordination of matters related to APANPIRG ANS Deficiencies;
2. Ensure the nominated point of contact is suitably qualified and empowered to engage with all internal stakeholders to action the resolution of deficiencies;
3. Conduct education activities to ensure all stakeholder organizations are aware of the obligations of the State under the Convention; and
4. Provide more information on the reasons for lack of progress, reasons for non-reporting, and internal priorities related to deficiency resolution.

Sub-Group 2/1
*PROPOSED APANPIRG
CONCLUSIONS/DECISIONS/RECOMMENDATIONS*

Draft Decision APANPIRG/29-X

That, APANPIRG, its Sub-Groups and technical bodies:

1. Prioritize deficiencies or deficiency areas annually;
2. Identify change-champion States for prioritized deficiency areas; and
3. Consider wherever possible locating Sub-Group and technical body meetings in sub-regional geographical areas of particular deficiency interest.

Sub-Group 2/1

PROPOSED APANPIRG

CONCLUSIONS/DECISIONS/RECOMMENDATIONS

RECOMMENDATION

That, ICAO

1. Improves the presentation of deficiency information to provide more context/details to improve State understanding of the issue; and
2. investigates appropriate technology solutions

Sub-Group 2/2

Regional Planning - Issues

○ Key question: how can we improve the poor progress of implementation of regionally agreed infrastructure plans?

- 3 main issues for implementation identified
 - 1. Resources (both human and financial)
 - 2. Collaboration mechanisms
 - 3. Guidelines on technical aspects

- 1. Resources
 - Size of project would affect each State's implementation
 - Understanding of Why? need justification
 - Balancing cost/benefit
 - Analysis of benefit/concerns
- 2. Collaboration mechanisms
 - Engagement with vendors
 - Alignment of stakeholders (to set requirements)
 - Data sharing/tracking (implementation status)
 - ATM system harmonization
 - incompatibility with national systems
 - Political will
- 3. Guidelines on technical aspects
 - Technical guidance on implementation
 - Common understanding of technical information
 - Minimum operational requirement standardization

Sub-Group 2/2

Regional Planning - Recommendations

- A. APANPIRG employs a more Change Management and Project Management approach to the implementation of Regional Implementation Plans
 - Create information on “changes” to justify resource commitment
 - Better decision-makers’ understandings of reasons, benefits and concerns of the changes
- B. ICAO enhances close engagement with States at the decision-making level
 - Regular/continuous high-level forum with both States (i.e. ministerial conf.) and Industry groups
 - Direct assistance from ICAO to States for better understanding

Sub-Group 2/2

Regional Planning - Recommendations

C. States consider ways to enable resource mobilization

- Multi-lateral mechanisms
- Drawing on resources from a wide pool

D. APANPIRG focus more on how to provide practical guidance with clear minimum operational requirement

- Workshops, training opportunity / training packages
- Operational requirement should be standardized

Sub-Group 2/2

Regional Planning - Recommendations

E. APANPIRG consider developing information sharing / collaboration platform

- Sharing experiences/lessons learned/Data
- Knowledge network via information system (i.e. online forum/repository)
- Industry/vendors involvement
- Focal points needs to be designated
- Visit exchanges between vendors / service providers

Sub-Group 2/3

Identifying Implementation Gaps and Potential Resources - Issues

- What is the baseline : Asia Pacific Seamless ATM plan, ICAO Annexes, ASBUs ?
- Develop State Plans endorsed by Ministers – APANPIRG outcomes briefed to Ministers/Decision Makers
- Better reflect the “Non Applicable” item for some States and then provide a place to explain why
- Reporting requests should be coordinated between ICAO HQ and RO to avoid duplication
- Monitoring to identify gaps but Challenges

- Ability for States to identify gaps and address
 - Understanding of requirements and how to implement
 - Difficulty to follow up all the APANPIRG working groups
 - Identify the real issue not just the gap
 - How to tackle the gap, a national level or on sub-regional ?
-
- Funding – Traffic volumes
 - Training and understanding of Seamless ATM requirements

- Technology changes that are challenges especially expertise and timeframes
- GAP –Formal Challenge – Assistance
- Attendance at meetings – Important for knowledge, experience and info transfer. Maybe Video Link, daily updates
- Criteria for the Implementation – Steps/Guidance
- Importance of task force for specific implementation – maybe a sub regional expert?
- States actively give assistance by training and knowledge not doing the implementation.

Sub-Group 2/3

Identifying Implementation Gaps and Potential Resources - Recommendations

- R1: APANPIRG agrees the baseline implementation document is APAC Seamless ATM Plan
- R2: States develop a National Plan based on the Asia/Pacific Seamless ATM plan owned by the Government (template)
- R3: ICAO to coordinate reporting to avoid duplication between Regional and Head Office
- R4: States provide assistance including attendance at Working Groups and Task Forces, also through bilateral/multilateral relationships
- R5: ICAO to identify common challenges to implementation not just specific State gaps
- R6: States actively share implementation challenges, issues and solutions through information papers
- R7: Each APANPIRG subgroup should state in the report the five key messages

ATTACHMENT 1 to the APANPIRG/29 Report

**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

LIST OF PARTICIPANTS

As of 4 September 2018

<i>Total States/Administrations</i>	27/2
<i>Total Int'l Organization</i>	7
Total - Participants	173

AUSTRALIA	2	NEW ZEALAND	3
BANGLADESH	3	PAPUA NEW GUINEA	2
BHUTAN	3	PHILIPPINES	2
CAMBODIA	2	REPUBLIC OF KOREA	7
CHINA	12	SAMOA	2
- HONG KONG CHINA	7	SINGAPORE	8
- MACAO CHINA	2	SRI LANKA	1
DPRK	4	THAILAND	19
FIJI	1	USA	9
INDIA	8	VIET NAM	5
INDONESIA	8		
JAPAN	3		
KIRIBATI	1	CANSO	1
LAO DPR	4	IATA	8
MALAYSIA	6	IBAC	1
MALDIVES	2	ICCAIA	4
MONGOLIA	2	IFALPA	2
MYANMAR	4	PASO	1
NEPAL	4	ICAO	20

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

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**TWENTY NINTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING
AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/29)**

OPENING REMARKS BY

MR. ARUN MISHRA

REGIONAL DIRECTOR, ICAO ASIA AND PACIFIC OFFICE

03 SEPTEMBER 2018

- **Directors General & Heads of Delegations**
- **Chairman and Vice Chairmen of APANPIRG**
- **Chairmen of contributory bodies of APANPIRG**
- **Distinguished members of the States' Delegations**
- **Members of International Organizations, Participants, Colleagues**
- **Ladies and Gentlemen**

Good Morning and welcome to the 29th Meeting of APANPIRG. We are very happy to note that we have about 175 participants from 30 States and 6 International org. I would also specifically like to acknowledge the presence of DGs and Heads of CAAs namely from Hong Kong China, New Zealand, Singapore and Malaysia. I also would like to introduce Mr Catalin Radu and Mr. Erwin Lassooij, from the Air Navigation Bureau, who are here all the way from Montreal to support this meeting. While the large number of participants are always welcomed by the Regional Office I must apologize in advance any inconvenience faced by the participants due to limitation of space and facilities during this conference.

2. 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 as these reports will be presented during the course of the meeting by the respective sub-groups. However, I would like to highlight some major developments since the last APANPIRG meeting as this will provide a good background for the discussions to follow during the next few days.

3. Following the 39th ICAO Assembly we in ICAO have taken significant steps to improve the implementation of our strategic objectives. We have developed Operating plans and business plans and align the activities of Regional Office with the ICAO HQs within this framework. We have also received generous support from some of the States in terms of secondments which has certainly strengthened our capacity towards attainment of our strategic objectives including our flagship program of No Country Left Behind.

4. ICAO is closely coordinating with the various bodies within the United Nations system to establish linkages between our strategic objectives with those of the UN Sustainable Development Goals for 2030. The objective is to bring in support and establish synergies for our ongoing programs from other UN agencies and International organizations.

5. For Asia Pacific 2017 has been a reasonably good year for safety record statistics. Our region with 33% global traffic had an accident rate of 1.83 in 2017 as compared to global average of 2.42 per million departures. Our accident rates are somewhat stabilized as we see a decrease of 8% in 2017 & 27% in 2016 compared to 2015. I am very happy to inform all of you that three States from our

Region have received awards this year from President of ICAO Council for their achievement in bringing their EIs above 60%, and these States are Bangladesh, Indonesia and Nepal.

The beginning of this year marked a major unique event i.e. the First APAC Ministerial Conference on Civil Aviation which was held in Beijing, China from 31 January to 1 February 2018 which most of you are aware. The APAC Ministers agreed on a set of time bound goals now known as Beijing Declaration which gives us a clear direction to strive for improving our aviation system. The targets agreed are not easy and would require a concerted cooperative approach to achieve them. A separate working paper will be presented later to discuss the Beijing declaration along with the responsibilities devolving upon us in the future.

A new version of the GANP and GASP are currently under development and will be presented for endorsement at the 13th Air Navigation Conference in October followed by a final consideration by the ICAO Assembly in 2019. ICAO would also review the Beijing Declaration objectives in order to reflect, as required, any resolutions agreed to by the ICAO Assembly including those on the endorsement of the GASP and GANP and initiate the organization of the Second Asia/Pacific Ministerial Conference on Civil Aviation in 2020 or thereafter.

6. At the 55th DGCA Conference in Fiji this year, Directors General will have an opportunity to discuss on three important issues related to *Beijing Declaration Commitment*:

Commitment on State Safety Programme: Implementation of an effective State Safety Programme (SSP) by 2025

Commitment on Aerodrome Certification: Certification of all aerodromes used for international operations by 2020

Commitment on Implementation of the Asia/Pacific Seamless Air Traffic Management (ATM) Plan by 2022: Implementation of Air Traffic Flow Management (ATFM) /Collaborative Decision Making (CDM) for high density airports

7. It's important to note that only few States in the Region have progressed in the implementation of SSP. About 20 % of international airports in the Region, which is approximately 40 airports used for international operations, are yet to be certified by States

8. To emphasise the challenge that the Ministers have committed States to, the progress of implementation of the Seamless ATM Plan has been well behind expectations, with only one of the ten priority elements achieved thus far and some elements such as Aeronautical Information Management woefully lagging. Despite the best efforts of the Regional Office and the Contributing Bodies and even the filing of APANPIRG Deficiencies, it appears that resources and appropriate actions are not been undertaken to achieve even the priority Block 'Zero' and Regional elements; yet next year we face the first year of the Global Air Navigation Plan's Block 1 elements.

9. This week you will hear about improvements in safety reporting from RASMAG – but on the other hand you will also be apprised of our region's safety hot spots, which require urgent attention by senior decision-makers. You will also note the improvement in reducing the incidence of non-approved RVSM aircraft, which can in part be traced to the firm policies on this matter by APANPIRG/28. However, one of the major challenges reported by RASMAG will be the relatively poor preparation for Performance-Based Communications and Surveillance.

10. The ATM/SG will report initiatives in East Asia, and in particular by China, to improve air traffic capacity and better manage civil/military cooperation. Unfortunately, our region continues to be challenged by sub-optimal civil/military cooperation practices in many parts, with resulting safety and efficiency issues, such as the short-notice operation of ballistic launch and space-re-entry activity. You will recall that the DGCA/54 urged States to address this area with a 'whole-of-government' approach as a high priority.

11. You will note that APANPIRG/27 endorsed and established the empowerment of APANPIRG Subgroups to approve their own Conclusions and Decisions on technical matters. This fundamental change required a change in focus on the matters that are to be discussed by APANPIRG – such as economic, environmental and political aspects that will not be dealt with by the Subgroups. However, we notice that some States are having difficulty understanding this paradigm shift and are still proposing technical papers for presentation at APANPIRG level. I would like to re-iterate that APANPIRG would now need to devote its time deliberating on issues relating to slow implementation, adequate provision of resources, forging new partnerships and collaborative arrangements to achieve the goal of overall uniform and sustainable development of APAC Region as the largest aviation region. Therefore, we need to focus on the higher level issues that inevitably have political, economic or environmental consequences, and try not to duplicate technical and operational discussion that should be managed by the Subgroups. Keeping in mind these changes it is imperative that the profile of the APANPIRG participants would need some changes. We would require more participation from senior decision makers like the DGCA's and the Heads of ANSPs as we will move away from discussing the ANS technical issues and their solutions to the area of implementation of solutions agreed by the contributory bodies.

12. Last APANPIRG had decided to form a Small Working Group that would review the effectiveness of the empowerment of APANPIRG Sub Groups to adopt Conclusions and Decision on matters related to purely technical and operational nature. While the outcome of the review conducted by the Small Working Group will be presented later by Hong Kong, China I can tell you in advance that the decision for empowerment has overall worked very well.

13. Last year we had conducted one-day workshop focussing on the implementation aspects of important decisions of previous APANPIRG meetings with the purpose to enable a process of self-appraisal and an opportunity for experience sharing to improve our processes for speedy implementation. After the workshop it was realized that implementation guidance is required to be developed and given to the States along with the State Letters for implementation of some Conclusions of APANPIRG's meeting. This year also we are going to have a half-day workshop on various issues relating to implementation on the third day of the meeting.

14. Like last year, this year as well we have fewer numbers 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 the benefit of all of us. I would like to thank the Chair of APANPIRG Mr. Graeme Harris for his support and guidance as well as Vice Chairs Mr Kevin Shum and Simon Li in addition to Chairs and Members of the various subsidiary bodies working under the APANPIRG for their significant contributions. I would also take this opportunity to acknowledge 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.

15. 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. The global air transport system as we know it today was built on cooperation among Member States and Industry partners. In recent years, the emphasis has been on promoting partnerships between States and regional bodies, as well as with industry, where much of the expertise resides. Always, the result is to provide users with the safest and most efficient mode of transportation possible.

16. This year, aviation regulator, service providers and industries are also participating in our programme either through sponsoring for meeting activities and/or installing their booths to demonstrate their products and services that can be used for safety and efficiency of air navigation services.

17. Before I conclude I would like to point out that during this week we have two important events organized in the region i.e. Air Cargo Development Forum to be held from 6-7 September 2018 in Zhengzhou, China and Asia Pacific Aviation Safety Seminar (APASS) on 5-6 September

2018 in Seoul, South Korea. While I complement the organizers and hosts for organizing these important events, the clash of dates with APANPIRG –RASG meetings makes it difficult for many of us to attend these events. So I would request in future all States and International organizations may ensure that dates for hosting these events are coordinated in a manner that they do not clash with existing Regional meeting schedule in order to facilitate wider participation at these events.

With these words I would wish all of us a very successful meeting and for the delegates a pleasant stay in Bangkok.

Thank you.

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

**TWENTY NINTH MEETING OF THE ASIA/PACIFIC
AIR NAVIGATION PLANNING AND IMPLEMENTATION
REGIONAL GROUP (APANPIRG/29)**

Bangkok, Thailand, 3 to 5 September 2018

LIST OF INFORMATION AND WORKING PAPERS

Paper No.	Agenda Item	Title	Presented by
INFORMATION PAPERS			
IP/01	—	Meeting Bulletin	Secretariat
IP/02	2	Promotion of Cyber Resilience through Global Awareness and Regional Exercises	USA
IP/03	2	UAS Integration Pilot Program	USA
IP/04	3.0	Status Upgrade of the Long-Term Vision for the Future Air Traffic Systems of Japan (CARATS)	Japan
IP/05	3.1	FAA Assistance to Airports in the Micronesia Region	USA
IP/06	3.1	Infrared Specifications for Aviation Obstruction Light Compatibility with Night Vision Goggles	USA
IP/07	3.2	Global Aeronautical Distress and Safety System	USA
IP/08	3.2	Enhancing Airspace Capacity through the Phased Implementation of AIDC Operation and Reduced Longitudinal Spacing in Hong Kong FIR	Hong Kong, China
IP/09	3.4	Space Based Augmentation System in Australia	Australia
IP/10	3.4	Status towards Commissioning Space-Based ADS-B	ICCAIA
IP/11	3.5	Airport Low-Level Wind Information (ALWIN)	Japan
IP/12	3.5	Facilitating Interactions between Space Weather Information Service Providers and Users	Japan
IP/13	3.1	Provisions on Permission for Using Civil Transport Airports in China	China
IP/14	2	Areas of interest for the United States at ICAO'S 13 th Air Navigation Conference	USA
IP/15	2	ICAO Workshop on Aeronautical Surveillance Systems Thailand 05-06 November 2018	Secretariat

LIST OF WORKING PAPERS

Paper No.	Agenda Item	Title	Presented by
WORKING PAPERS			
WP/01	-	Adoption of the Provisional Agenda	Secretariat
WP/02 Revision 1	1A	Outcome of the First Asia/Pacific Ministerial Conference on Civil Aviation	Secretariat
WP/03	1B.1	Review of the Actions of the Air Navigation Commission on the Report of the APANPIRG/28	Secretariat
WP/04 Revision 1	1B.1	Review of the action taken by the ANC and the Council on the Consolidated Annual Report on APANPIRG/28	Secretariat
WP/05	1B.2	Status of Implementation of APANPIRG/28 Conclusions and Decisions	Secretariat
WP/06 Revision 1	1B.3	Status of Implementation of Outstanding APANPIRG Conclusions and Decisions	Secretariat
WP/07	1C	Report of the Fifth Coordination Meeting between the Chairpersons of APANPIRG and RASG-APAC	Secretariat
WP 08	1C	RASG/7 and APRAST/11 - 12 Meeting Outcomes	Secretariat
WP/09 Revision 1	3.1	Report on the Second Meeting of AOP Sub Group	Chairman of AOP/SG
WP/10 Revision 1	3.2	ATM/SG/6 Report	Secretariat
WP/11	3.3	RASMAG/23 Outcomes	Secretariat
WP/12	3.4	Report on the Twenty Second Meeting of CNS Sub-Group	Chairman of CNS SG
WP/13	3.5	Meteorology Sub-Group Report	Chairman of MET SG
WP/14	3.6	Past and Future Activities of the ICAO Asia and Pacific Regional Sub-Office	Secretariat
WP/15 Revision 3	4	Status of Air Navigation Deficiencies in the Asia/PAC Region	Secretariat
WP/16	5	APANPIRG Work Programme 2018+	Secretariat
WP/ 17	6	Report of the Review of Effectiveness of Sub Groups' Empowerment to adopt Conclusions and Decisions	Hong Kong, China on behalf of Small Working Group
WP/18	1C	CANSO Standard of Excellence in SMS and SEANS-Safety	CANSO
WP/19	2	Potential of Space-based ADS-B to improve Global Aviation Safety	ICCAIA

Paper No.	Agenda Item	Title	Presented by
WP/20	3.4	Acquisition Excellence for ANSPs	CANSO
WP/21	3.4	Need for ATS Surveillance and Direct Controller and Pilot Communication VHF Coverage Charts for the Region	Hong Kong, China
WP/22 Revision 1	3.4	Successful Implementation of Common Aeronautical Virtual Private Network Between Hong Kong and Manila	Hong Kong, China
WP/23	2	Implementation Support for the Global Reporting Format for Runway Surface Conditions	Secretariat
WP/24 Revision 2	2	PBN Approach Charts – Regional Plan for Transition from RNAV to RNP	Secretariat
WP/25 Revision 1	2	Implementation Support for the New SID/STAR Phraseologies	Secretariat
WP/26	2	Risk Assessment for Civil Aircraft Operations over or near Conflict Zones – Comprehensive Guidance Material and Practices for States, Operators, and ANSPs	Secretariat
WP/27	1C	Enhancing Support for the Implementation of Effective Safety Management	Secretariat
WP/28 Revision 1	2	Establishing the Aviation Community Operational Resilient Network Services (ACORNS)	USA
WP/29 Revision 1	2	Promotion of a Global System-Wide Information Management Framework	USA
WP/30	3.4	Global Harmonization of the DATACOM Implementation for Realization of TBO	Japan
WP/31	3.4	The Necessity of Harmonization for Implementation of New Operations	Japan

No.	Title	Presented by
FLIMSY		
01	Safety and Air Navigation Overview - Implementation	Secretariat

No.	Title	Presented by
PRESENTATION		
01	Safe Travels Committed to leave no one behind	Secretariat

ATTACHMENT 4 to the APANPIRG/29 Report

APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/1 A & B	Declaration on Asia/Pacific Ministerial Conference on Civil Aviation	That, a) States/Administrations be urged to allocate necessary resources to meet the Beijing Declaration Targets and Commitments on Aviation Safety, Air Navigation Services, Accident Investigation and Human Resources Development; b) APANPIRG Contributory Bodies to assist and monitor the implementation of related aspects of Beijing Declaration and report progress to the annual APAC DGCA Conference; and c) Secretariat to review the Beijing Declaration objectives in 2020 in order to reflect, as required, any resolutions agreed to by the ICAO Assembly in 2019, including those on the endorsement of the new versions of the Global Aviation Safety Plan (GASP) and Global Air Navigation Plan (GANP), and initiate the organization of the Second Asia/Pacific Ministerial Conference on Civil Aviation in 2020 or thereafter.	APAC States APANPIRG Sub groups ICAO APAC RO	State Letter Action in accordance with the Conclusion	31 October 2018 Not specified

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/2 A & B	Safety and Air Navigation overview – implementation	That, given the fast growth in aviation and the advent of new entrants, it is imperative that: a) ICAO through Regional and national planning and implementation be prioritized and seamlessly linked to Global Planning; b) a project management structure be required as a vehicle to address the process from planning to implementation; and c) in order to elevate political will and increase opportunities for funding, projects be linked to the UNSDGs and the National Development plans.	ICAO APAC RO ICAO HQ & APAC RO APAC States	State Letter	31 October 2018
C 29/3 A	Safety Management Implementation support	That, a) the nominated focal points submit practical implementation examples and tools using the secure portal; and b) States are encouraged to make use of the updated tools and training once made available.	ICAO APAC RO APAC States	State Letter	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
 APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/4 A & B	Implementation support for Global Reporting Format (GRF) for Runway Surface Conditions	That, in the interest of a widespread and harmonised implementation: a) States and concerned aviation stakeholders are encouraged to actively participate in the Global GRF Symposium; and b) States are encouraged to host regional GRF seminars.	ICAO APAC RO APAC States	State Letter	31 October 2018
C 29/5 A & B	Asia Pacific Regional Guidance on Requirements for the Design and Operations of Water Aerodromes for Seaplane Operations	That: 1) the <i>Asia Pacific Regional Guidance on Requirements for the Design and Operations of Water Aerodromes for Seaplane Operations</i> placed in Appendix A to the Report on Agenda Item 3.1 is adopted as regional policy and made available on the ICAO APAC website; and 2) the WASWG had completed all tasks as per its TOR and be dissolved.	ICAO APAC RO	State Letter Regional Guidance Material posted on APAC Website	31 October 2018
C 29/6 E	Airports Climate Change Adaptation Measures	That Asia/Pacific States urge airport operators to identify the potential impacts of climate change on airports operations and related infrastructure and consider appropriate adaptation measures to address the potential climate change impacts.	ICAO APAC RO APAC States	State Letter Action in accordance with the Conclusion	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/7 A & B	Transition Planning for RNP APCH CHART Identification from RNAV to RNP	Recognizing ICAO Circular 353, Transition Planning for Change to Instrument Flight Procedure Approach Chart Identification from RNAV to RNP will be finalized to provide guidance on the development of global, regional and State transition plans, and ICAO Regional Office is requested to develop a draft transition plan within twelve months of the final publication of the Circular, that:	ICAO APAC RO	State Letter	31 October 2018
		a) States begin internal coordination on the State transition plan and provide the number of RNP APCH procedures published and planned, and the time required to transition from RNAV (GNSS)/RNAV (RNP) to RNP chart identification;	APAC States	Action in accordance with the Conclusion	31 August 2018
		b) ICAO Regional Office drafts a regional transition plan on RNP APCH chart identification in coordination with relevant regional contributory bodies of APANPIRG, sub-regional ATM coordination groups and regional stakeholders; and c) ICAO Regional Office conducts a meeting or workshop to discuss the regional transition plan, after a regional transition plan template has been provided by the ICAO PBN Programme Office.	ICAO APAC RO/RSO ICAO APAC RO/RSO	Regional transition plan on RNP APCH chart Meeting or workshop to discuss the regional transition plan (with PBNICG/6)	31 October 2018 31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/8 A & B	Proposal for amendment to PANS-ATM (Doc4444) on ADS-B related Phraseology	Recognizing that: - where system functionality is derived from the same source for both MODE S SSR and ADS-B the phraseology used between ATC and pilots should be the same; - in almost all cases, the pilot interfaces with the ADS-B system through the SSR transponder interface; and - the use of ADS-B-specific phrases may cause confusion between pilots and ATC; ICAO be invited to amend PANS-ATM to remove the following phrases: 12.4.3.5 “RE-ENTER ADS-B AIRCRAFT IDENTIFICATION” 12.4.3.7 “TRANSMIT ADS-B IDENT” 12.4.3.10 “STOP SQUAWK TRANSMIT ADS-B ONLY” or “STOP ADS-B TRANSMISSION, SQUAWK (CODE) ONLY” 12.4.3.11 “TRANSMIT ADS-B ALTITUDE” 12.4.3.13 “STOP ADS-B ALTITUDE TRANSMISSION [(WRONG INDICATION, or reason)]”	ICAO APAC RO ICAO HQ	IOM	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
 APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/9 A & B	Procedures for Ballistic Launch/Space Re-entry Management	That, States are urged to: (1) ensure adoption and sensitisation of the ballistic launch/space re-entry expectations contained with the <i>Asia/Pacific Seamless ATM Plan</i> ; and (2) institutionalise the related guidance and State Planning Checklist provided at Appendix A to the Report on Agenda Item 3.2.	ICAO APAC RO APAC States	State Letter with Implementation GM Action in accordance with the Conclusion	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/10 A & B	Minimizing the Impact of Non-ICAO Procedures and Requirements for Military Activities Affecting Civil Aviation	That, where the imposition of non-ICAO military requirements and procedures affecting international civil aviation is either planned or likely, States are urged to ensure that civil aviation interests are taken into account by: 1) ensuring military authorities are fully informed of the obligations of all States that are signatory to the Convention on International Civil Aviation; 2) conducting full and timely consultation with airspace users, adjacent States and ICAO; 3) implementing the capability to tactically share FPL and ATS messages, civil ATC surveillance data and other relevant information between the ANSP and military authorities; 4) implementing direct communications facilities between military organizations and the ANSP to permit the coordination of requests for information on any unknown aircraft; 5) establishing civil-military coordination functions within civil air traffic control centres; 6) promulgating timely, clear and unambiguous information on the requirements and procedures, and accurate, detailed charts in accordance with the requirements of ICAO Annex 4 and Annex 15; and 7) where pre-authorizations for individual civil flights in affected areas are necessary, States are urged to either consider: i) issuing authorizations with the seasonal schedule approval; or ii) developing and rigorously test clear and, ideally, automated procedures for compliance such as the use of flight plan data.	ICAO APAC RO APAC States	State Letter with Implementation GM Action in accordance with the Conclusion	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
 APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
D 29/11 A & B	AIRARD/TF Terms of Reference	That, the Advanced Inter-Regional Air Traffic Services Route Development Task Force (AIRARD/TF) Terms of Reference at Appendix B to the Report on Agenda Item 3.2 be approved by the Asia/Pacific (APAC) Region.	ICAO APAC RO	State Letter Notify AIRARD/TF	31 October 2018
D 29/12 A & B	Revised APUAS/TF Terms of Reference	That, recognizing the scope of work on Unmanned Aircraft Systems (UAS), and particularly UAS Traffic Management (UTM) Systems being undertaken at the global level by the UAS Advisory Group, the revised APUAS/TF Terms of Reference at Appendix C to the Report on Agenda Item 3.2.	ICAO APAC RO	State Letter Notify APUAS/TF	31 October 2018
C 29/13 A & B	ICAO Action to Provide Support and Guidance Material to Facilitate AIS – AIM Transition	That, ICAO is urged to: 1. provide guidance on the best practice on the establishment of a support team, training and handling of data inconsistencies to facilitate digital eAIP implementation; and 2. provide guidance on best practices for implementing AIM Roadmap Phase 3 Steps P-19, P-20 and P-21.	ICAO APAC RO ICAO HQ	IOM	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/14 A & B	GADSS Aircraft Tracking Requirement	To support compliance with the Global Aeronautical Distress and Safety System (GADSS) aircraft tracking requirements applicable 08 November 2018 that: a) States should provide information to the ICAO APAC Regional Office where actual Air Traffic Control tracking capability does not meet the GADSS requirements in their area of responsibility, together with a timeline for promulgation of regulatory requirements for airlines to submit requests for variations and exemptions; and b) ICAO HQ be requested to ensure that other ICAO regions affected take action in accordance with a), and consolidate the information to make it available to all aircraft operators and States.	ICAO APAC RO APAC States ICAO HQ	State Letter Action in accordance with the Conclusion	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/15 A & B	SAR and GADSS in the GANP	That, Asia/Pacific States are urged to advocate for: a) inclusion of Search and Rescue (SAR) as a Basic Building Block (BBB) and the Global Aeronautical Distress and Safety System (GADSS) functions within the Sixth edition of the Global Air Navigation Plan (GANP) by - i) sending SAR experts; and ii) presenting SAR-related papers to the Thirteenth Air Navigation Conference (Montreal, Canada, 9 – 19 October 2018); and b) greater resources within ICAO HQ to ensure an effective oversight of SAR.	ICAO APAC RO APAC States ICAO HQ	State Letter with Implementation GM Action in accordance with the Conclusion	31 October 2018
C 29/16 A & B	Using IPS Routers between BBIS Administrations	That, utilize IPS router and encourage to phase out X.25 and IP SND CF (ATN) router by allowing IPS routers to inter-connect between BBIS Administrations when CRV or other inter-regional IP networks being utilized.	ICAO APAC RO APAC States	State Letter	31 October 2018
C 29/17 A & B	Revised Strategy for Implementation of Communication systems to support Air Navigation Service	That, the revised Strategy for implementation of Communication systems to support Air Navigation Service provided in Appendix A to the Report on Agenda Item 3.4 be adopted.	ICAO APAC RO	Posted on APAC Website and State letter to notify States	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/18 A & B	Support allocation of radio spectrum for space based VHF communications	That,	ICAO APAC RO	State Letter	31 December 2018
		a) States and ICAO be invited to initiate and support the ITU application process of allocating an appropriate aeronautical VHF frequency band for space-based aeronautical mobile communication service for WRC-2023;	APAC States	To support in accordance with the Conclusion	July 2019
		b) States and ICAO be invited to take note of the potential benefits of space-based VHF aeronautical mobile communication service to enhance safety, capacity and efficiency of air navigation services by supporting the Proof-of-Concept tests; and c) ICAO is invited to assign three aeronautical VHF channels for the duration of the Proof-of-Concept tests.	ICAO APAC RO		May 2019

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

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ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/20 A & B	Ground Based GNSS Status Monitoring	Recognizing that the availability of GNSS is crucial for GNSS based PBN procedures, that the performance of GNSS on the ground may be different from that in the aircraft, and that the States should determine essential radio navigation services for GNSS based approach, landing or take-off, which require timely warnings on the GNSS status to ATC services,	ICAO APAC RO	State Letter	31 December 2018
		That, States be urged to: a) define the essential radio navigation services for GNSS based operations; b) be aware that requirement for air traffic controllers to provide real time GNSS status monitoring to aircraft for GNSS ABAS procedures may not be required; c) ensure that GNSS/RAIM unavailability prediction be provided to users; d) ensure that pilot reports as far as practical on GNSS status should be provided to ATC for dissemination to other aircraft as real time GNSS information; and e) reflect their operational procedures within AIC and/or AIP.	APAC States	Action in accordance with the Conclusion	

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/21 A & B	Revised ADS-B Version 2 ADS-B Out Forward Fit Equipage	Review APANPIRG Conclusion 26/44 regarding fitment of Version 2 ES ADS-B, to revise the applicable date as per the below: 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 2020 be equipped with ADS-B avionics compliant with Version 2 ES (equivalent to RTCA DO-260B) or later version.	ICAO APAC RO APAC States	State Letter Action in accordance with the Conclusion	31 October 2018
C 29/22 A & B	Survey on Surveillance and DCPC VHF Coverage	That, States/Administrations be urged to respond to regular survey on Surveillance and Direct Control and Pilot Communication (DCPC) VHF Coverage to be circulated through an ICAO State Letter and advise the Point of Contact.	ICAO APAC RO APAC States	State Letter with Implementation GM Action in accordance with the Conclusion	31 December 2018
D 29/23 A & B	Removal of deficiencies Index No. AP-MET-09 and AP-MET-11 from the APANPIRG (open) list	That, APANPIRG removes the deficiencies Index No. AP-MET-09 and AP-MET-11 from the APANPIRG (open) list.	ICAO APAC RO	Action in accordance with the Decision	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
 APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
D 29/24 A & B	Removal of deficiency Index No. AP-MET-12 from the APANPIRG (open) list	That, APANPIRG removes the deficiency Index No. AP-MET-12 from the APANPIRG (open) list.	ICAO APAC RO	Action in accordance with the Decision	31 October 2018
C 29/25 A & B	APAC Regional Guidance for MET Information Supporting ATM	That, APANPIRG approves the <i>Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations</i> , located at the ICAO Asia and Pacific Office website and copied at Appendix A to the APANPIRG/29 Report on Agenda Item 3.5, as a reference for States and Organizations concerned.	ICAO APAC RO	Approved Guidance material posted in APAC Website	31 October 2018
D 29/26 A & B	Updated terms of reference of the MET SG (including work plan)	That, APANPIRG approves the updated terms of reference of the MET SG (including work plan) located at Appendix B to the APANPIRG/29 Report on Agenda Item 3.5.	ICAO APAC RO	Notify MET SG	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
 APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/27 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/SAR/AIM, 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 APAC RO APAC States	State Letter with Implementation GM Action in accordance with the Conclusion	31 October 2018 Before the respective Sub Group Meeting in 2019.

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/28 A & B	Empowerment to adopt Conclusions and Decisions on purely technical/operational matters by APANPIRG's Sub Groups	That, the empowerment to APANPIRG Sub Groups to adopt Conclusions and Decisions on technical/operational matters has been working effectively and considering its benefit for effectiveness of APANPIRG work: 1) APANPIRG Subgroup should adopt Conclusions/Decisions related to: a) any amendment to TOR, including an extension of time of Working Group/Taskforce formed under relevant Subgroup; and b) all technical and operational aspects of Subgroup's work within its TOR. 2) APANPIRG Subgroup should formulate Draft Conclusions/ Draft Decisions and submit to APANPIRG for adoption: a) any amendment to TOR, including an extension of time of Working Group/Taskforce formed under TOR approved by the APANPIRG; b) APANPIRG Air Navigation Deficiencies¹; and c) report on slow progress by States in implementation aspects. 3) ICAO Secretariat would indicate clearly in the report of the Sub-group meeting on how the cross Sub-group Conclusions/Decisions to be coordinated and endorsed; and 4) As per empowerment principle, APANPIRG Subgroups or Taskforce/Working Groups are empowered to make Conclusions/Decisions related to regional guidance material for publication in ICAO APAC website. ¹ <i>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.</i>	ICAO APAC RO APANPIRG Sub groups ICAO Secretariat APANPIRG Sub groups or Task force/Working Groups	State Letter Action in accordance with the Conclusion	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
 APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/29 A & B	State Handling of ICAO Correspondence	That, States and Administrations are urged to review and implement an improved focal point system for receipt, dissemination and response to ICAO correspondence with consideration on: a) Process control for systematic tracking and management of ICAO State letters within State and APAC; b) Nomination of a competent focal point with appropriate training; and c) Additional focal point support as necessary.	ICAO APAC RO APAC States	State Letter with Implementation GM Action in accordance with the Conclusion	31 October 2018

ATTACHMENT 4 to the APANPIRG/29 Report
APANPIRG/29 Conclusions/Decisions – Action Plan

Conclusion/ Decision No --- Strategic Objective*	Title of Conclusion/Decision	Text of Conclusion/Decision	Responsibility	Deliverable	Target Date
C 29/30 A & B	State Actions on Air Navigation Deficiency	That, States are urged to 1. Ensure the nominated Air Navigation Deficiency point of contact is suitably qualified and empowered to engage with all internal stakeholders to action the resolution of deficiencies; 2. Conduct education activities to ensure all stakeholder organizations are aware of the obligations of the State under the Convention; 3. Keep the relevant APANPIRG Sub-Groups informed of their corrective actions on identified deficiencies; and 4. Provide more information on the reasons for lack of progress, reasons for non-reporting, and internal priorities related to deficiency resolution.	ICAO APAC RO APAC States	State Letter with Implementation GM Action in accordance with the Conclusion	31 October 2018
D 29/31 A & B	APANPIRG Actions on Air Navigation Deficiency	That, APANPIRG, its Sub-Groups and technical bodies: 1. Prioritize Air Navigation Deficiency or deficiency areas annually; 2. Seeking support of States to assist States with prioritized deficiency areas; and 3. Consider wherever possible locating workshop/seminar in sub-regional geographical areas of particular deficiency interest.	APANPIRG Sub Groups ICAO APAC RO	Action in accordance with the Decision	31 October 2018

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