



ICAO

*International Civil Aviation Organization*

**The Third Meeting of the South Asia, Indian Ocean and  
Southeast Asia ATM Coordination Group (SAIOSEACG/3)**

Bangkok, Thailand, 16 – 19 April 2024

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### **Agenda Item 3: Review of Current Operations and Problem Areas**

#### **AIRSPACE SAFETY MONITORING**

(Presented by Secretariat)

##### **SUMMARY**

This paper presents outcomes relevant to the ATM/SG from the Future Air Navigation Services (FANS) Interoperability Team – Asia (FIT-Asia) and the Regional Airspace Safety Monitoring Advisory Group (RASMAG).

## **1. INTRODUCTION**

1.1 The Thirteenth Meeting of the FANS Interoperability Team-Asia (FIT-Asia/13) and the Twenty-Eighth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/28) were held by video teleconference from 06 to 09 June 2023 and 21 to 24 August 2023 respectively.

1.2 RASMAG is a Sub-Group of APANPIRG, and the FIT-Asia reports to RASMAG.

1.3 Meeting documentation and the final report of the meeting are available on the FIT- Asia/32 and RASMAG/28 can be found at the following webpages:

- a. [icao.int/APAC/Meetings/Pages/2023-FIT-Asia13.aspx](https://www.icao.int/APAC/Meetings/Pages/2023-FIT-Asia13.aspx)
- b. [icao.int/APAC/Meetings/Pages/2023-RASMAG-28.aspx](https://www.icao.int/APAC/Meetings/Pages/2023-RASMAG-28.aspx)

## **2. DISCUSSION**

### *FIT-Asia Meeting Outcomes*

#### *FIT-Asia Problem Reports*

2.1 FIT-Asia/13 had been provided with updated information on the status of Asia/Pacific engagement in data link problem reporting through the FANS-CRA website, and performance analysis reporting to a recognized FIT. All Asia/Pacific States that provide data link services had registered on the FANS-CRA website.

2.2 FIT-Asia/13 was informed that the CRA could not thoroughly investigate some PRs because the dates of poor performance occurred too long before the PRs were submitted for relevant Communications Service Provider (CSP) and avionics logs to be available. Since CSP and avionics logs would be available for a limited period of time, Air Navigation Service Providers (ANSPs) were urged to take necessary actions promptly, including submitting PR.

2.3 The CRA also informed the FIT-Asia/13 meeting that multiple recent PRs in various areas were caused by problems with aftermarket retrofit avionics that aircraft operators installed without aircraft manufacturer involvement. In these cases, the responsibility to investigate and resolve the problems should be primarily on the aircraft operator and its avionics supplier, although the aircraft manufacturer would provide support as appropriate. In response to a query, FIT-Asia/13 was informed that IPACG and ISPACG had yet to discuss the matter at their meetings. FIT-Asia would discuss it further at future meetings.

*Establishment of service agreement with the APANPIRG-recognized CRA*

2.4 The FIT-Asia/13 meeting was informed that since the beginning of 2023, the CRA had no contract in place for its services in the Bay of Bengal and Arabian Sea areas. Accordingly, the CRA closed six new PRs in those areas without investigating them. Given that the PRs all involved Boeing aircraft, however, the CRA recommended to the PR originator to report the problems directly to Boeing for investigation. A side meeting was held to discuss the matter with the concerned State, the CRA, IATA and ICAO.

2.5 The RASMAG List of Competent Airspace Safety Monitoring Organizations (Last updated 25 July 2022) was reviewed and updated by FIT-Asia/13. The FIT-Asia/13 meeting was informed that ICAO had learned that not all FIT-Asia member administrations had formal service agreements with APANPIRG-recognized CRAs. **Table 1** shows the current formal CRA service agreements.

	APANPIRG-recognized CRA	Scope of application	formal service agreement
IPACG, ISPACG (United States)	CRA Boeing	IPACG States, ISPACG States, and NAT States	Yes
Japan	CRA Japan	Japan	Yes
SEASMA (Singapore)	CRA Boeing	Singapore, Philippines, and Viet Nam	Yes
India	CRA Boeing	India	Yes (Not for 2023)

**Table 1:** Current formal CRA service agreements

2.6 Subsequent to the FIT-Asia/13 meeting, ICAO reviewed the situation and considered that, given the importance of data link problem reporting in States' performance monitoring obligations under Annex 6 Operation of Aircraft Part 1<sup>1</sup> and Annex 11 Air Traffic Services<sup>2</sup>, APNPIRG/34 adopted the following Conclusion:

**Conclusion APANPIRG/34- 16: Formal Service Arrangements with CRA**

That, States are urged to ensure that formal service arrangements are made with an APANPIRG-recognized, competent Central Reporting Agency for the submission and analysis of data link problem reports.

*PBCS Global Charter*

2.7 FIT-Asia/13 was reminded that the Performance-Based Communications and Surveillance (PBCS) Implementation Strategy for the APAC Regions, and the PBCS Action List for ANSPs, urged all ANSPs using PBCS to support ATM operations to sign up to the PBCS Global Charter.

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<sup>1</sup> Annex 6 Part I 7.1.5 and 7.3.4

<sup>2</sup> Annex 11 2.29 and 3.3.5.2

2.8 The FIT-Asia/13 meeting was also reminded that the PBCS Charter was not intended to be a long-term solution. It was provided as a PBCS performance specification option in place of or in addition to contractual agreements with CSPs. Therefore, ANSPs and Aircraft Operators were urged to sign up for the Charter as the most effective means and approach to monitor CSP compliance, which was an essential PBCS component.

*Review of Annual PBCS Survey of the Implementation of Performance-based Horizontal Separation Minima*

2.9 The Survey of the Status of Current and Planned Implementation of Performance-based Horizontal Separation Minima form had been amended to reflect the current separation minima in the *Procedures for Air Navigation Services – Air Traffic Management* (PANS ATM – Doc 4444) at FIT-Asia/12 in 2022.

2.10 FIT-Asia/13 was informed that some items in section 4 of the survey form might require clarification because the current and planned status were mixed in the survey. In addition, there were some editorial errors in the form. The meeting agreed the following ***Conclusion RASMAG/28-2: Revised Survey of the Status of Current and Planned Implementation of Performance-Based Separation Minima.***

*Asia/Pacific Region Combined PBCS Monitoring Report*

2.11 The report highlighted consolidated performance data and issues associated with Actual Surveillance Performance (ASP) and Actual Communications Performance (ACP) for the region.

2.12 Overall ASP for the region had met the 95% criterion. Brisbane FIR (YBBB) was the only FIR that cleared all RSP criteria in 2022. Overall ACP for the region met the 95% criterion. Chennai FIR (VOMF) was the only FIR that cleared all RCP criteria in 2022. It was again noted that HF data link (HFDL) performance results did not meet PBCS performance requirements in all FIRs.

*FIT-Asia Task List*

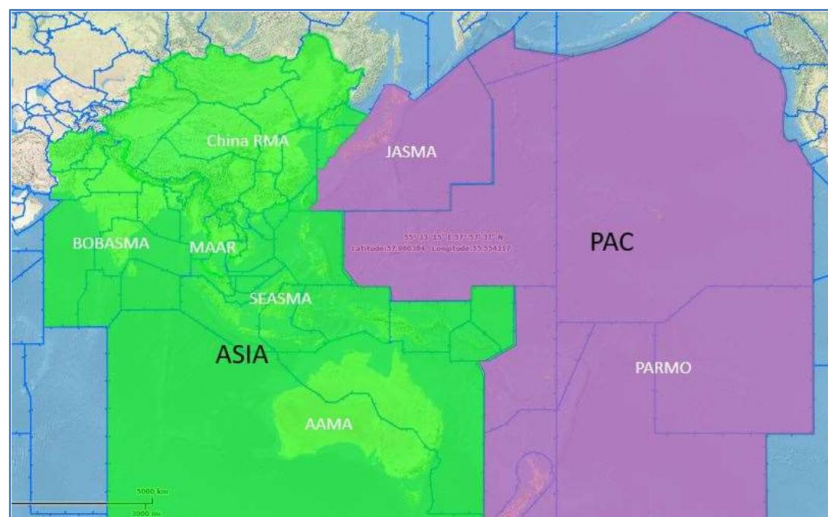
2.13 The ninth meeting of FIT-Asia (FIT-Asia/9), held in Bangkok from 1-5 July 2019, had discussed a review of Regional Guidance Material for End-to-End Monitoring of Data Link Systems, and agreed to conduct a review of the Guidance Material, with a view to removing any material that may be redundant, or that duplicated material that was available in the GOLD Manual and PBCS Manual, and ensuring that all other contents correctly reflected current regional expectations for data link monitoring and reporting. The review would also take into consideration the formalization of Regional procedures for the reporting of PBCS non-compliance to the relevant Regional Monitoring Agency (RMA) or En-route Monitoring Agency (EMA), and guidance for response to such reports by the State of Registry.

2.14 However, as the task required non-FIT-Asia States/Administrations' contribution, the FIT-Asia has yet to complete the task. Therefore, FIT-Asia proposed transferring the task to RASMAG, where all member States/Administrations in the Region were participating. The meeting agreed to include this item in the RASMAG Task List.

RASMAG/28 Meeting Outcomes

*APAC Consolidated Safety Report*

2.15 The Monitoring Agency for the Asian Region (MAAR) presented a combined summary of the safety analysis results for the Asia/Pacific Region, on behalf of the Asia/Pacific RMAs and EMAs. This report covered Asia area only (**Figure 1**). The full APAC consolidated Safety Report can be found in RASMAG/28 Final report, Appendix F.



**Figure 1:** Asia and Pacific Safety Reporting Areas

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#### *Asia Area Vertical Collision Risk*

2.16 The Asia vertical collision risk estimates had been above TLS each year from 2016 to 2020 but trending downwards since 2017 due to various safety improvement initiatives (**Table 2**). The 2022 vertical collision risk estimate was below TLS. There was a total of 518 LHDs reported in the Asia area in 2022, with total duration 192 minutes and zero levels crossed.

Year	Vertical Overall Risk Estimate (x 10 <sup>-9</sup> fapfh)	Remark
2022	1.53	Below TLS
2021	4.03	Below TLS
2020	7.42	Above TLS
2019	12.88	Above TLS
2018	15.50	Above TLS
2017	27.30	Above TLS
2016	12.53	Above TLS

**Table 2:** Asia Area Vertical Collision Risk Estimates 2016 – 2022

#### *Asia Area Horizontal Safety Assessments*

2.17 The estimated horizontal collision risk for 2022 for the Asia area met TLS in all longitudinal and lateral risk categories (**Table 3**). There were two LLDs and LLEs reported in the Asia area in 2022, with a duration of 104 minutes.

Asia Area – annual flying hours = 503,528 hours (51% increase from 2021)			
2022 Asia Area	Risk Estimation	Airspace	Remarks
30NM Lateral Risk	$0.068 \times 10^{-9}$	SEA	Below TLS
50NM Longitudinal Risk	$0.096 \times 10^{-9}$	SEA	Below TLS
30NM Lateral Risk	$0.786 \times 10^{-9}$	SEA	Below TLS
50NM Longitudinal Risk	$0.475 \times 10^{-9}$	SEA and SA/IO	Below TLS
2021 Asia Area	Risk Estimation		Remarks

30NM Lateral Risk	$0.0015 \times 10^{-9}$	SEA and SA/IO	Below TLS
50NM Longitudinal Risk	$1.02 \times 10^{-9}$	SEA and SA/IO	Below TLS
<b>2020 Asia Area</b>	<b>Risk Estimation</b>		<b>Remarks</b>
30NM Lateral Risk	$0.0004 \times 10^{-9}$	SEA and SA/IO	Below TLS
50NM Longitudinal Risk	$0.85 \times 10^{-9}$	SEA and SA/IO	Below TLS
<b>2019 Asia Area</b>	<b>Risk Estimation</b>		<b>Remarks</b>
30NM Lateral Risk	$0.0001 \times 10^{-9}$	SEA and SA/IO	Below TLS
50NM Longitudinal Risk	$0.25 \times 10^{-9}$	SEA and SA/IO	Below TLS

**Table 3:** Asia Area Horizontal Collision Risk 2019 - 2022

*Safety Reporting – Asia and Pacific Area*

2.18 **Table 4** shows the number of LHD, LLD and LLE reports for 2017 to 2022, and the number of reports per flying hours. Total estimated flying hours had been increasing since 2020, 7,234,881 hours in 2020, 7,604,927 in 2021 to 10,240,138 hours in 2022. The overall reporting rate of LHDs/LLDs/LLEs decreased in 2022.

Airspace	# Reports						1 Report : Flying Hrs					
	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022
<b>DPRK</b>	0	0	0	0	0	0	-	-	-	-	-	-
<b>Mongolia</b>	4	1	2	0	1	0	1: 37,771	1: 158,891	1: 82,138	-	1: 121,621	-
<b>SEA</b>	474	205	152	42	70	62	1: 6,548	1: 17,757	1: 22,275	1: 25,106	1: 15,456	1: 32,620
<b>SA/IO</b>	935	681	439	152	135	143	1: 3,166	1: 3,783	1: 7,955	1: 7,907	1: 11,167	1: 21,018
<b>Japan</b>	71	76	77	66	80	75	1: 21,510	1: 20,632	1: 20,762	1: 14,737	1: 13,528	1: 18,751
<b>China</b>	134	110	79	85	105	72	1: 18,248	1: 22,229	1: 31,119	1: 26,867	1: 15,477	1: 18,003
<b>Pacific</b>	42	43	173	134	176	179	1: 54,191	1: 45,064	1: 10,139	1: 6,404	1: 6,638	1: 8,280
<b>Indonesia</b>	34	23	37	18	41	54	1: 10,842	1: 53,603	1: 33,321	1: 17,346	1: 7,402	1: 8,060
<b>SW Pacific</b>	51	53	101	46	47	81	1: 17,572	1: 17,817	1: 9,335	1: 6,954	1: 11,975	1: 5,352
<b>ROK and AKARA</b>	5	12	34	5	24	108	1: 117,090	1: 28,365	1: 18,959	1: 25,965	1: 6,285	1: 1,056
<b>Total</b>	<b>1,750</b>	<b>1,204</b>	<b>1,094</b>	<b>548</b>	<b>679</b>	<b>774</b>	<b>1: 8,180</b>	<b>1: 12,332</b>	<b>1: 14,330</b>	<b>1: 11,712</b>	<b>1: 11,200</b>	<b>1:13,230</b>

**Table 4:** Total LHD, LLD and LLE Reports, and Reports per Flying Hours, 2017 - 2022

*Hot Spots*

2.19 **Table 5** summarizes current LHD Hot Spots, the FIRs involved, the year of identification, and status remarks.

Hot Spot	Involved FIRs	Identified	Remarks
A1	Kolkata/Dhaka-Yangon	2015	Cat. E LHDs. Risk reduced.
A2	Chennai – Yangon/Kuala Lumpur	2015	Cat. E LHDs reduced. Risk reduced. Potential non-hot spot 2023 (RASMAG/28)
B	Incheon (AKARA Airspace)	2015	- Risk at Incheon-Fukuoka ACC interface mitigated. - Cat. E LHDs and risk at Incheon-Shanghai ACC interface reduced

D	Manila – all adjacent FIRs	2015	- Cat. E LHDs and risk at Manila/ Fukuoka FIR boundary reduced. - Risk at all other Manila FIR boundaries mitigated.
F	Mogadishu – Mumbai	2015	Cat. E LHDs reducing. Risk reducing.
G	Sanaa/Muscat – Mumbai	2015	Cat. E LHDs. Risk reducing.
J	Jakarta – Singapore/Kota Kinabalu	2018	Cat. E LHDs.
M	Colombo – Melbourne	2019	LHDs and risk reducing. Awaiting response to establish a POC before removing from the hot spot list.
N	Oakland USA – Hawaii CEP	2019	Cat. E LHDs increasing. Risk increasing
O	Bangkok /Ho Chi Minh/Kuala Lumpur - Singapore	2023	Cat. E LHDs.

**Table 5:** LHD Hot Spots in the Asia/Pacific Region

2.20 The meeting discussed the following changes to the Asia Pacific Consolidated report: The meeting agreed that all hot spots except A2 be retained this year, and monitored for another year before considering their reclassification as potential non-hot spots can be removed and one new Hot Spot ‘O’ has been added.

*Note: LHD hot spots that meet the RASMAG criteria for deletion are identified as ‘potential non-hot spots’ and monitored for a further twelve months before removal, subject to continuing to meet the criteria.*

*Review of the Guidance Material for Continued Safety Monitoring of APAC RVSM Airspace*

2.21 MAAR proposed changes to the Guidance Material for the Continued Safety Monitoring of the Asia-Pacific RVSM Airspace. This review of the Guidance Material included contents from the LHD Material Package and updated information arising from APANPIRG conclusions and decisions since its first publication in 2019. RASMAG agreed to the proposed changes, and to the following: **Conclusion RASMAG/28-3: Guidance Material for the Continued Safety Monitoring of the Asia Pacific RVSM Airspace Version 2.**

*Guidance of PBCS Non-Compliance Reporting*

2.22 ICAO presented guidance for PBCS non-compliance reporting, amendments to the PBCS non-compliance form, Monitoring Agencies Terms of reference and PBCS action list for ANSP.

2.23 Each ANSP was expected to submit non-compliance reports to the respective RMA every month. A NIL report was required, similarly to LHD/LLD/LLE reporting. RMAs were required to forward reports to the designated EMAs (where applicable) for follow-up action and to inform the State of operator/registry of non-compliant aircraft. Furthermore, EMAs had to compile the submission by States by month as a part of the annual report. In addition, some improvements to the guidance were suggested, including the streamlining of PBCS non-compliance submission flow chart.

*Asia Pacific Flight Information Region and Responsible Monitoring Agency*

2.24 ICAO proposed the adoption of a stand-alone document detailing the Asia Pacific Flight Information Regions and Responsible Monitoring Agencies, to be maintained on the ICAO APAC website, and the consequential removal of this information from the EMA handbook. The meeting agreed the following: **Conclusion RASMAG/28-4: Removal of EMA handbook Appendix A and**

**Guidance for PBCS Non-Compliance Reporting.**

*Update information on the EUR RMA FPRAVP*

2.25 MAAR provided an update on the extension of the Flight Plan RVSM Approval Verification Process (FPRAVP), a proactive system created to reject flight plans of aircraft not approved for RVSM operations within the European airspace. The upcoming phase of the FPRAVP extension aims to incorporate seven additional States within the EUR RMA RVSM area, with the possibility of these States joining the scheme in 2024.

2.26 Based on the most recent bulletin version (version 21.8), there were still five MAAR State aircraft that continued to be listed on the EUR RMA bulletin, despite their previous inclusion in Bulletin version 17.7 in July 2022. **Table 6** presents a list of aircraft under MAAR's responsibility that were listed on the EUR RMA Bulletin.

State of Operator	Operator Name	Aircraft Registration	Aircraft Type
India	Air Force of India	K3601	E35L
	Air Force of India	K3604	E35L
	Air Force of India	G2961	GLF2
	Air Force of India	GB8001	GL5T
Pakistan	Army of Pakistan	805	B350

**Table 6:** List of MAAR rogue aircraft on the EUR RMA Bulletin

RVSM Approvals and filing of RVSM indicator by State aircraft

5.1 The resultant survey supported by **Conclusion APANPIRG/32-6** indicated that the majority of the 15 responding States/administrations, would like Asia Pacific RMAs to continue to cross-check 'W' in State Aircraft's flight plans against RMAs' RVSM database and try to resolve the discrepancies. Therefore, the work of checking State aircraft RVSM approvals would remain with the RMAs.

2.27 As the rejection of such flight plans of non-RVSM aircraft started to gain more traction in European region, this could prompt States of non-EU origin to take more actions. It was noted that RVSM approval data for several of the banned aircraft from APAC Region had subsequently been provided to MAAR. However, these appeared to be government transport aircraft, and not military aircraft. However, APAC state aircraft operating solely within APAC region may still pose an issue. Therefore, the task item RASMAG25/2 should remain open and monitored.

2.28 The meeting noted that the RVSM approval audit process conducted by RMAs was effective for identifying State aircraft operating in RVSM airspace without the appropriate RVSM approvals. RMAs were encouraged to continue this important audit process.

2.29 Regarding RASMAG action item task 26/4 concerning a mitigation for Hot Spot M, the meeting noted that AAMA, ICAO, MAAR and Sri Lanka had sent various formal letters to DGCA India for the nomination of a POC from the Indian Navy. India informed the meeting that the nomination of POC was in the final process of approval.

*APAC Consolidated LTHM Compliance Status*

2.30 MAAR presented the overview of LTHM compliance status in the APAC Region, including assessments of five APAC RMAs – AAMA, China RMA, JASMA, MAAR and PARMO.

The assessment, based on RVSM approval data as of at 30 June 2023, yielded a remaining monitoring burden in the APAC Region of 503 aircraft, which was a 5% decrease since 2021.

*APANPIRG List of Deficiencies Consideration*

2.31 **Table 7** lists the States having a remaining monitoring burden of 30% or more, which could be subject to an APANPIRG ATM and Airspace Safety Deficiency.

State	2021	2022
Papua New Guinea (AAMA)	46%	69%
Indonesia (AAMA)	52%	63%
Pakistan (MAAR)	73%	62%
Solomon Islands (AAMA)	50%	50%
Nepal (MAAR)	45%	46%
Mongolia (MAAR)	29%	39%
New Zealand (PARMO)	8%	36%
Bangladesh (MAAR)	25%	33%

**Table 7:** List of States having monitoring burden over 30% as of 30 June 2023

*Regulatory process PBCS operational approvals*

2.32 With reference to action item 26/1 of the RASMAG Task List, a preliminary study of administrations had been conducted. Some of the data was deduced from submitted approvals data of individual airframes, and some administrations had confirmed the use of direct operational approvals. The study only represented a small number of APAC administrations and it was still unclear where other process of approvals are employed.

2.33 Therefore, a survey was proposed to seek information from States to improve understanding by RASMAG and FIT-Asia of the PBCS approval process of APAC member states, and whether PBCS approvals issued were in accordance with Annex 6 and PBCS manual Doc 9869 chapter 4. RASMAG agreed to the following: **Conclusion RASMAG/28-5: Survey for Asia Pacific States PBCS Approval Process.**

*ANS Deficiencies List*

2.34 The meeting reviewed the APANPIRG ATM and Airspace Safety Deficiency List and agreed to make the following recommendation to APANPIRG/34, as recorded in Appendix H to the RASMAG/28 Report. The following additions and removal of deficiencies were agreed by APANPIRG/34.

- a) To be retained in the Deficiencies list
- Afghanistan (Failure to submit Kabul FIR Large Height Deviation (LHD) data).
  - Afghanistan (Remaining monitoring burden of 62%, RASMAG/26).
  - Pakistan (Remaining monitoring burden of 62%, RASMAG/28).
  - India (Post implementation monitoring not implemented, - Performance monitoring and analysis not reported for the Mumbai FIR).



- Maldives (Post implementation monitoring not implemented - Problem reports not provided to CRA. Performance monitoring and analysis not reported to FIT).

b) Removal of Deficiency:

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)

- Brunei Darussalam.

c) Add new Deficiency

Long Term Height Monitoring requirement – remaining burden more than 30%

- Bangladesh (Remaining monitoring burden of 33%, RASMAG/28).
- Indonesia (Remaining monitoring burden of 63%, RASMAG/28).
- Mongolia (Remaining monitoring burden of 39%, RASMAG/28).
- Nepal (Remaining monitoring burden of 46%, RASMAG/28).
- New Zealand (Remaining monitoring burden of 36%, RASMAG/28).
- Papua New Guinea (Remaining monitoring burden of 69%, RASMAG/28).
- Solomon Islands (Remaining monitoring burden of 50%, RASMAG/28).

### 3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note –
  - i. **Conclusion APANPIRG/34-16: Formal Service Arrangements with CRA**
  - ii. **Conclusion RASMAG/28-2: Revised Survey of the Status of Current and Planned Implementation of Performance-Based Separation Minima;**
  - iii. **Conclusion RASMAG/28-3: Guidance Material for the Continued Safety Monitoring of the Asia Pacific RVSM Airspace Version 2;**
  - iv. **Conclusion RASMAG/28-4: Removal of EMA handbook Appendix A and Guidance for PBCS Non-Compliance Reporting;**
  - v. **Conclusion RASMAG/28-5: Survey for Asia Pacific States PBCS Approval Process;**
- b) note the current LHD hot spots, proposal of potential non-spot and new hot spot;
- c) note the update on the extension of the Flight Plan RVSM Approval Verification Process (FPRAVP);
- d) note the retention of existing, deletion and addition of new, ATM and Airspace Safety Deficiencies; and
- e) discuss any relevant matters as appropriate.

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