INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE 4th MEETING OF THE FANS INTEROPERABILITY TEAM-ASIA (FIT-ASIA/4) AND THE 20TH MEETING OF THE REGIONAL AIRSPACE SAFETY MONITORING ADVISORY GROUP (RASMAG/20)

BANGKOK, THAILAND, 25 – 28 MAY 2015

The views expressed in this Report should be taken as those of the Meeting and not the Organization

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

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APPENDICES TO THE REPORT OF FIT-Asia/4 and RASMAG/20

INTRODUCTION

Meetings

1.1 The Fourth Meeting of the Future Air Navigation Systems Interoperability Team-Asia (FIT-Asia/4) was held on 25 May 2015 at Bangkok, Thailand and the Twentieth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/20) was held from 26-28 May 2015 at the same venue.

Attendance

2.1 A total of 61 participants attended either or both the FIT-Asia/4 and RASMAG/20 meetings from Australia, Bangladesh, China, India, Indonesia, Japan, Lao PDR, Mongolia, Philippines, Republic of Korea, Singapore, Thailand, the United States, Viet Nam, IATA, and ICAO. The list of participants is at **Appendix A** to this report.

Officers and Secretariat

3.1 Dr. Paisit Herabat, Expert, Director Level (Aeronautical Radio of Thailand) chaired the FIT-Asia/3 meeting. Mr Shane Sumner, Regional Officer ATM, acted as the Secretary to the FIT-Asia/4 meeting.

3.2 Mr. Robert Butcher, Systemic Analysis, Monitoring and Review Manager, Safety and Assurance Group, Airservices Australia, chaired the RASMAG/20 meeting. Mr. Len Wicks, Regional Officer, ATM, ICAO Asia and Pacific Office acted as the Secretary for the RASMAG/20 meeting.

Opening of the Meeting

4.1 On behalf of Mr Arun Mishra, Regional Director of ICAO Asia and Pacific Office, Mr. Shane Sumner and Mr. Len Wicks welcomed all participants.

4.2 Dr. Paisit Herabat and Mr. Robert Butcher welcomed participants to the respective meetings. On behalf of the meeting, Mr. Butcher expressed thanks to long serving RASMAG member Mr. Toby Farmer from New Zealand, who was unable to attend RASMAG/20 and who would retire in August this year. The meeting acknowledged the valuable contributions that Mr Farmer has contributed to the RASMAG since its inception and his significant work in enhancing the safety of Asia/Pacific airspace and ATM operations.

Documentation and Working Language

5.1 The working language of the meeting and the language for all documentation was English. A total of nine working papers (WPs), two information papers (IPs) and one flimsy were presented to FIT-Asia/4, and 32 WPs, seven IPs and three flimsies were presented to RASMAG/20. The list of papers and presentations is shown at **Appendix B** to this report.

Draft Conclusions, Draft Decisions and Decisions of RASMAG/FIT-Asia – Definition

6.1 RASMAG recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

a) **Draft Conclusions** deal with matters that, according to APANPIRG terms of reference, require the attention of States, or action by the ICAO in accordance with established procedures;

b) **Draft Decisions** deal with the matters of concern only to APANPIRG and its contributory bodies; and

c) **Decisions** of RASMAG or the FIT-Asia that relate solely to matters dealing with the internal working arrangements of the RASMAG or FIT-Asia.

List of Decisions and Draft Conclusions/Decisions

7.1 List of Draft Decisions

Draft Decision RASMAG/20-1: Data Link Performance Reporting Template and Guidance

That, the revised Data Link Performance Reporting Template and Guidance at **Appendix D to the Report** replaces the Data Link Performance Reporting Template on the ICAO Asia/Pacific Regional Office website.

7.2 List of Draft Conclusions

Draft Conclusion RASMAG/20-2: Data Link Performance Guidelines

That, FIT-Asia States are urged to:

a) Monitor data link performance against the RCP240 and RSP180 criteria specified in Appendix B of the Global Operational Data Link Document (GOLD); and

b) apply the guidelines specified in the GOLD Appendix D to determine whether fleet performance either:

i. Meets the 99.9% performance level; or

ii. Requires submission of CRA problem reports and/or investigation that will attempt to determine the cause of the degradation.

Note: Gold Version 2.0 Appendix D Paragraph D.2.4.7.5.2 refers.

Draft Conclusion RASMAG/20-3: ANS Deficiencies Relating to Data Link Performance Monitoring and Analysis

That, an Air Navigation Deficiency should be raised against non-implementation of the provisions of Annex 11 Paragraph 2.27.5 when any FIT-Asia 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.

Draft Conclusion RASMAG/20-4: Asia/Pacific LHD Hot Spot Action Plans

That, the following Regional Monitoring Agencies (RMAs), States and ATC units should take urgent action* to establish a scrutiny group or an alternate means to address the following Large Height Deviation (LHD) hot spot areas and present Action Plans and details of progress made to the ICAO Regional Office, prior to 01 January 2016:

a) **MAAR**, India, Myanmar and Malaysia – Kolkata/Chennai FIRs interface with Yangon/Kuala Lumpur FIRs;

b) **PARMO**, China RMA, JASMA, MAAR, China, Japan, Republic of Korea and Taibei Area Control Centre (ACC) – Incheon FIR AKARA Corridor interface with Shanghai/Fukuoka/Taibei FIRs;

c) **China RMA**, MAAR, China and Hong Kong China– Hong Kong FIR interface with Guangzhou/Sanya FIRs;

d) **MAAR**, AAMA, JASMA, Hong Kong China, Indonesia, Japan and the Philippines – Manila FIR interface with Fukuoka/Hong Kong China/ Singapore/Ujung Pandang FIRs; and

e) **China RMA**, MAAR, China and Pakistan – Urumqi FIR interface with Lahore FIR.

**Action should be taken as soon as practicable, even prior to APANPIRG/26 if possible.*

Note: the RMAs in bold were expected to take the lead in organising the scrutiny groups or alternative means to address the issues.

FIT-Asia/4

REPORT ON AGENDA ITEMS – FIT-Asia/4

Agenda Item 1: Adoption of Agenda

1.1 The provisional agenda (WP/01) was adopted by the meeting.

Agenda Item 2: Central Reporting Agency Report

FIT-Asia CRA Arrangements, Problem Reports, and Performance Data Analysis Reporting (WP02)

2.1 The Secretariat provided information following-up on discussions at FIT-Asia/3 relating to data link problem and performance reporting by FIT-Asia Administrations.

2.2 The FIT-Asia Terms of Reference (TOR) required that it support FIT-Asia participant States' compliance with ICAO Annex 11 – *Air Traffic Services* and Global Operational Data-Link Document (GOLD) requirements for data-link performance.

2.3 FIT-Asia/3 had been informed that there was a considerable lack of data-link problem reporting among FIT-Asia States and airspace users, and few FIT-Asia States had arrangements in place for the analysis of problem reports by a competent Central Reporting Agency (CRA). While the number of States making arrangements for the analysis of problem reports had improved, overall there had been little reporting of both problems and performance data analysis.

2.4 The meeting was informed that 25th Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/25, Kuala Lumpur, Malaysia, 8 – 11 September 2014), adopted *Conclusion APANPIRG 25/2 – APAC Regional Air Navigation Priorities and Targets*, endorsing ten regional priorities and targets including the implementation of data-link, in line with the performance objectives of the Asia/Pacific Seamless ATM Plan.

2.5 The meeting was reminded that the FIT-Asia TOR required, *inter-alia,* that it conducted activities to support FIT-Asia participant States' compliance with ICAO Annex 11 – *Air Traffic Services* and Global Operational Data-Link Document (GOLD) requirements for data-link performance.

2.6 Monitoring, reporting and analysis of data-link performance and problems is essential for the achievement and maintenance of system performance required for the application of RNP based separation standards. In order to conduct these activities, arrangements for the reporting and analysis of data-link problems must be made between FIT-Asia administrations and a competent CRA. The Informal South Pacific ATS Coordinating Group/FANS Implementation Team (ISPACG/FIT) was recognized by RASMAG as a competent CRA, and provided a CRA service for FIT/Asia States.

2.7 The meeting was reminded of the following Conclusion, drafted by FIT-Asia/2 (Bangkok, Thailand, 26 – 27 May 2014) was agreed by APANPIRG/24 in June 2013:

Conclusion 24/24: ADS/C and CPDLC Problem Reporting and Analysis

That, FIT-Asia States are requested to:

- *register on the FIT-Asia website (http://www.ispacg-cra.com), and report their registration to the ICAO Asia/Pacific Regional Office by 31 December 2013;*
- *report problems relating to Automatic Dependent Surveillance-Contract (ADS-C) and Controller Pilot Data-Link Communications (CPDLC) services to the Central Reporting Agency (CRA) for analysis, utilizing the FIT-Asia website; and*
- *ensure the CRA analysis is reported to FIT-Asia.*

2.8 The data link service status of 11 FIT-Asia States was unknown. Eleven FIT-Asia administrations were either providing ADS-C/CPDLC services, or expected to do so by November 2015 under the performance objectives of the Seamless ATM Plan. Six FIT-Asia administrations were registered for FIT-Asia CRA, while three administrations were registered for CRA through the South East Asia Safety Monitoring Agency (SEASMA), with their CRA service uncertain beyond September 2016. **Appendix C** lists all FIT-Asia administrations and their:

a) data link service status;

b) Seamless ATM expectation to implement ADS-C/CPDLC (where known);

c) FIT-Asia CRA registration status;

d) Record of submission of problem reports to the FIT-Asia CRA; and

e) Record of provision of ADS-C/CPDLC performance data analysis to FIT-Asia.

2.9 **Table 1** lists the FIT-Asia administrations that had either implemented ADS-C/CPDLC, or were expected to do so under the Asia/Pacific Seamless ATM Plan, and their FIT-Asia CRA registration status.

Administration	Data-Link (ADS-C/CPDLC) Service Status	Seamless ATM Expectation (Nov 2015)	FIT-Asia CRA Registration
China	Implemented	YES	YES
India	Implemented	YES	YES
Indonesia	Implemented	YES	**YES**
Malaysia		YES	**YES**
Myanmar	Implemented	YES	**YES**
Maldives	Implemented	YES	**YES**
Philippines		YES	SEASMA*
Singapore	Implemented	YES	SEASMA*
Sri Lanka	Implemented	YES	
Thailand			
Viet Nam	Implemented	YES	SEASMA* **YES**

* *The South East Asia Safety Monitoring Agency (SEASMA) provides CRA service for Philippines, Singapore and Viet Nam. Current SEAMA CRA arrangements expire September 2016.*

Table 1: FIT-Asia ADS-C/CPDLC Implementation and CRA Registration Status.

2.10 Since FIT-Asia/3, only two administrations had submitted problem reports to FIT-Asia CRA. The FIT-Asia CRA website administrator had noted that several problem reports could not be assessed, as the data link service provider only retains logs for 90 days.

2.11 Only three administrations had submitted performance data analysis to FIT-Asia/4.

2.12 It was noted by the meeting that Pakistan, which was not present at the meeting, had separately notified the recently held 3rd Meeting of the Ad-Hoc Afghanistan Contingency Group (AHACG/3) that installation of ADS-CPDLC capability had been completed, and it was likely to be operational in the July/August 2015 period.

CRA Services for South Asia (WP06)

2.13 IATA provided an update on continuation of the CRA services for India and South Asia Flight Information Regions (FIRs). IATA had contracted Boeing on behalf of Airports Authority of India to provide CRA services for India and the South Asia area. IATA was in the process of renewing the CRA service contract with Boeing through to Dec 31st 2016, and expected to continue this arrangement to at least 2018 or until AAI indicated a wish to take over the CRA service for the future. The service covered the airspace of India, Maldives, Myanmar and Sri Lanka, and would also cover Bangladesh when implemented there.

CRA Problem Reports Analysis (Presentation 1)

2.14 The Boeing CRA presented an analysis of data link problem reports analysed since FIT-Asia/3. It was noted by Boeing CRA that there 10 problem reports that were not analysed during the last year as the log data was no longer retrievable due to the lateness of the submission of the problem report. States were urged to go to the website and enter the problem report immediately, to allow for timely data retrieval and analysis.

2.15 It was also noted that most of the problems reported related to fundamental errors, indicating a lack of familiarity with GOLD procedures and guidance. While States should be familiar with GOLD, it was recognized that it would be beneficial to provide a short video presentation of known problem areas, particularly CPDLC hand-off processes.

2.16 The Boeing CRA informed the meeting that any new ATS unit coming on line or making automation system changes could contact Boeing CRA to arrange data link functional and performance testing using the test-bed facilities.

2.17 The meeting noted that there were occasional difficulties in logging on to the CRA website. Boeing CRA was requested to provide further information on the CRA workflow, and more clarity on how to use the website.

Agenda Item 3: Review of ADS/CPDLC Operations

Data Link Performance Report for ATS Route L888 (WP03)

3.1 China provided data link performance data for the period October 2014 to March 2015, for the L888 FANS route. Data link services had been provided on ATS route L888 in remote western China since 2001, using a variety of ground systems that may provide services to FANS 1/A aircraft.

3.2 The performance data was collected from the Chengdu (ZUUU), Lanzhou (ZLLL) and Urumqi (ZWWW) FIRs. The performance data was measured against Required Communication Performance (RCP) 400 specification, and presented using the FIT-Asia performance reporting template.

3.3 CPDLC Actual Communications Performance (ACP) for messages sent within three centres (ZUUU, ZLLL, ZWWW) per media type media type (Satellite, Very High Frequency - VHF and High Frequency - HF) was measured against the 95% 320 second and 99.9% 370 second requirements for RCP400, using the 4274 CPDLC transactions recorded during the period of Oct. 2014 to Mar. 2015. 100.00% performance was achieved for all three media types.

3.4 The ADS-C Downlink Latency of HF failed to meet the 95% target, due to the long latency of the messages from some HF stations (**Figures 1 and 2**).

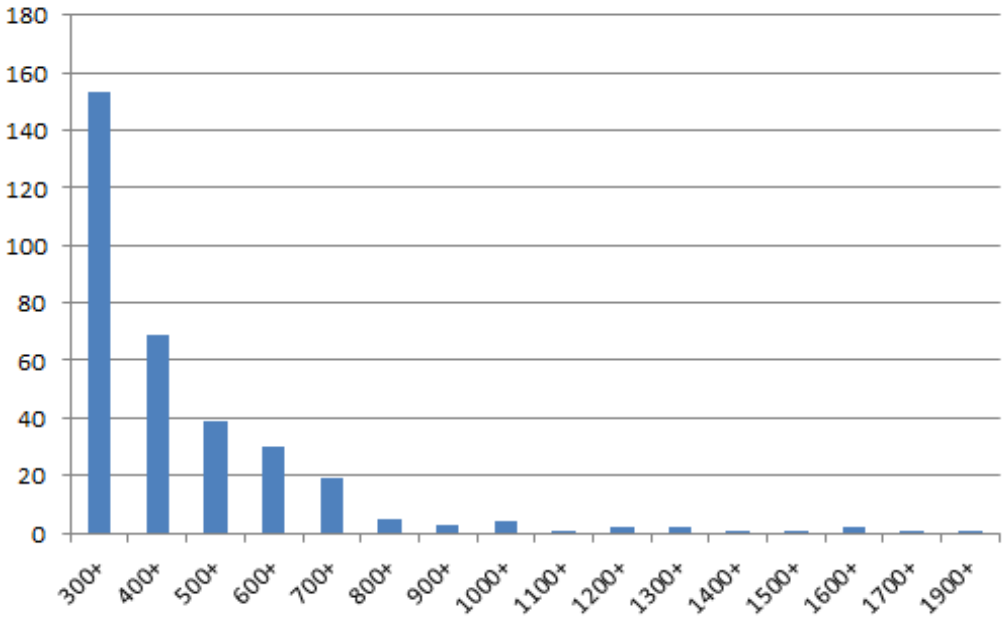

Figure 1: ADS-C Downlink Messages (latency over 300 seconds)

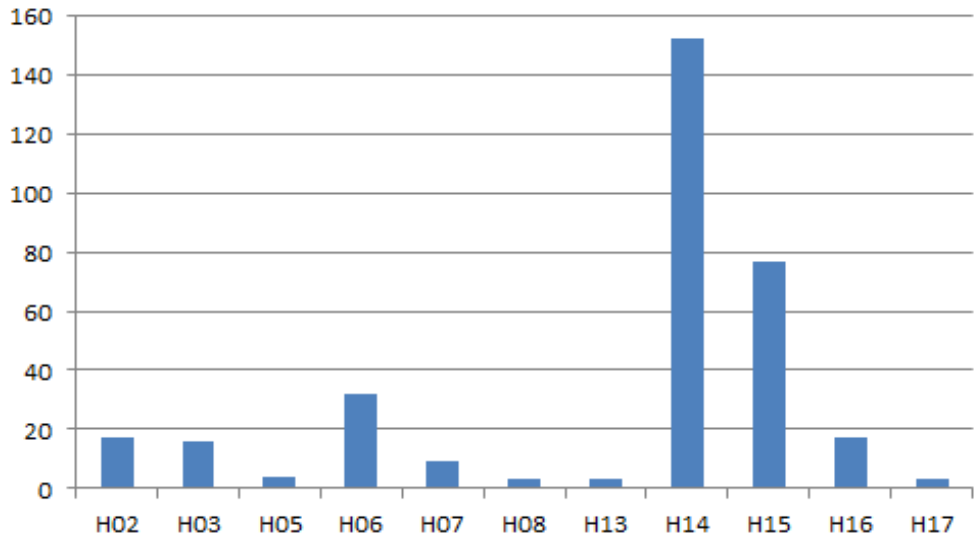

Figure 2: ADS-C Downlink Messages by HF Station (latency over 300 seconds)

3.5 In discussing the HF ADS-C Downlink Message Latency, it was agreed that China would provide information on which aircraft types were reverting to HF, and Boeing CRA would then endeavour to determine why.

3.6 The CPDLC ACP per operator was measured against the 95% 320 second and 99.9% 370 second requirements for RCP400, using the 4274 CPDLC transactions with 23 operators during the period of Oct. 2014 to Mar. 2015, with 100.00% performance being achieved in all cases.

3.7 China applied data link ground station information (station identifier and media type) to perform the analysis, but each year it was difficult to obtain a complete list containing all the ground stations. Boeing CRA agreed to provide a list of INMARSAT GES and HF ground station identifiers for future reference.

3.8 In response to a query, China advised that performance was measured against the RCP400 standard because reduced separation was not currently applied in the airspace concerned.

Data Link Performance Report for Singapore FIR (IP03)

3.9 Singapore presented data link performance for the Singapore FIR for the period May 2014 to April 2015. The performance data was measured against GOLD RCP and RSP requirements. Data link performance in the Singapore FIR generally met the RCP 240 and RSP 180 performance requirements, either meeting or just falling below the 99.9% performance targets and meeting the 95% targets.

3.10 It was noted that the Pilot Operational Response Time (PORT) performance was higher than normally experienced in other regions, where it was common for a few operators' performance to be below the required level.

FANS1/A Performance in Chennai FIR (WP04)

3.11 India provided the meeting with analysis of the observed performance of the ADS/CPDLC data link within the Chennai Flight Information Region during a twelve month period from January 2014 to December 2014.

3.12 The India Bay of Bengal Arabian Sea Indian Ocean Safety Monitoring Agency (BOBASMA) had endeavoured to collect the ADS and CPDLC data as per the GOLD from the four ground systems at Chennai, Mumbai, Delhi and Kolkata. The ATM automation systems at Mumbai, Delhi and Kolkata were being upgraded so as to enable collection of ADS & CPDLC data for performance monitoring of the ground systems at these three stations. The GOLD Performance Analysis Tool (GPAT) tool version 3 was used for monitoring Chennai FIR data link performance for 12 months starting from January 2014 to December 2014.

3.13 **Table 2** provides ACP for SAT-COM and VHF media, measured against the RCP-240 requirement of 99.9% transactions to be completed within 210 seconds and 95% to be completed within 180 seconds. The ACP met the 95 percentage but fell just below the 99.9% criteria.

Chennai FIR CPDLC ACP				
Messages		% >180 sec (Target 95%)	% >210 sec (Target 99.9%)	Remarks
SAT	33541	99.29%	99.64%	
VHF	55544	99.67%	99.77%	
ALL	89085	99.53%	99.72%	

Table 2: VOMF FIR CPDLC ACP per Media Type

3.14 **Table 3** summarized ADS- C downlink latency of Chennai FIR for SAT-COM and VHF media for the period of January 2014 to December 2014 measured against the GOLD, which described the RSP-180 criteria. The ADS-C data link messages sent via satellite and VHF met the 95 percentage but also fell below the 99.9 percentage criteria.

Chennai FIR ADS-C Downlink Latency				
Messages		% >90 sec (Target 95%)	% >180sec (Target 99.9%)	Remarks
SAT	2,19,861	96.71%	98.90%	
VHF	2,71,388	98.24%	99.45%	
All	4,91,249	97.56%	99.20%	

Table 3: Chennai FIR ADS-C Downlink latency per Media Type

3.15 **Figure 3** presented CPDLC ACP per operator within Chennai FIR for the period of January 2014 to December 2014. All operators satisfied RCP-240 criteria of 95 percent of transactions within 180 seconds, but only a few operators met the criteria of 99.9 percentage transitions within 210 seconds.

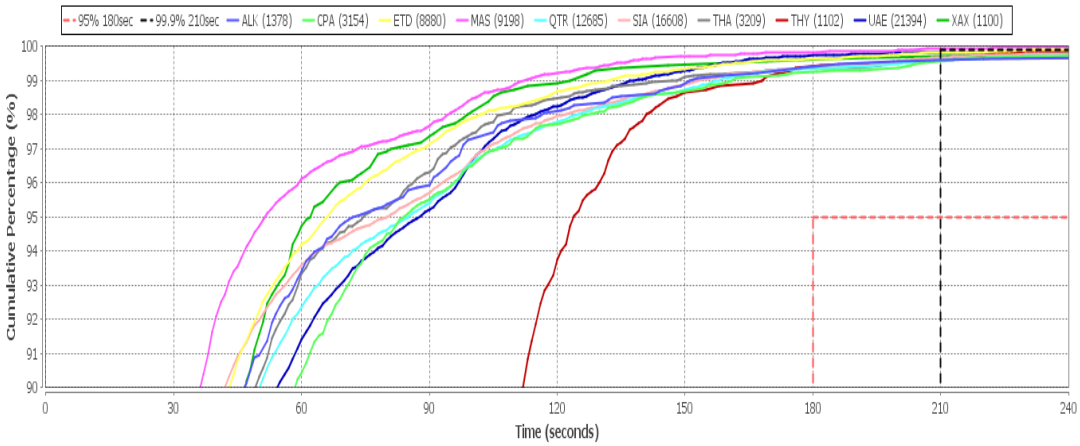

Figure 3: Chennai FIR CPDLC ACP per operator

3.16 India advised the meeting that approximately 62% of the traffic within the Chennai FIR were data link equipped.

Data Link Implementation in Indonesian FIRs (IP04)

3.17 Indonesia presented the history of data link implementation in the Indonesia FIRs, and information on planned integration of ADS-C/CPDLC with the Jakarta Air Traffic Services Centre (JATSC).

3.18 Data link services had been provided in the Ujung Pandang FIR since 23 September 2010. An operational trial had been running in the Jakarta FIR, and operational implementation was expected in September 2015.

Agenda Item 4: Data-Link Guidance Material

Revised Data Link Performance Reporting Template and Guidance (WP/05)

4.1 The Asia/Pacific Region Data Link Performance Reporting Template, developed by FIT-Asia/2, was found to be in need of further editorial and structural amendment. There was also a need for some brief guidance for the use of the template. The Secretariat provided an updated template and guidance for its completion, for consideration by the meeting.

4.2 The revised template had corrections of a number of errors of content and format. It had been restructured, particularly in its *Attachment A – Additional Analysis* section, to present information in a more logical sequence.

4.3 The template changes were summarized as follows:

- Removal of yellow-highlights to reduce visual clutter, replaced in most cases by either [CONTENT] or [XXXX] to indicate where the State should add textual information;
- The Working Paper section now included provision for summary analysis of:
  - CPDLC Actual Communications Performance (ACP) for the entire analysis period, per data link media type (Satellite, VHF and HF);
  - CPDLC Actual Communications Technical Performance (ACTP) for the entire analysis period, per data link media type;
  - CPDLC ACP per Operator (de-identified) for the entire analysis period; and
  - ADS-C Latency for the entire analysis period, per data link media type.
- The *Attachment A – Additional Analysis* section provided for more detailed analysis of each of the above performance domains in a more logical sequence:

4.3 Basic guidance material for completion of the template included:

- Reference and a link to the *Global Operational Data-Link Guidance Document* (GOLD) and the GOLD Performance Analysis Tool (GPAT);
- The statement that all FIT-Asia States should register on the FIT-Asia CRA website, and report all data-link problems detected through performance analysis or other reports
- Reference and a link to the *Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia Pacific Region (Version 4.0 – February 2011)*
- Information relating to the timeliness of submission of problem reports to the Central Reporting Agency (CRA)

4.4 The FIT-Asia/4 meeting agreed that a common January - December data link performance reporting period each year should be used by FIT-Asia States. It was also suggested that reporting of outages should also be provided for in the template; thus the meeting agreed to a Draft Decision. The following Draft Decision was endorsed by RASMAG/20, for consideration by APANPIRG/26:

Draft Decision RASMAG/20-1: Data Link Performance Reporting Template and Guidance

That, the revised Data Link Performance Reporting Template and Guidance at **Appendix D to the Report** replaces the Data Link Performance Reporting Template on the ICAO Asia/Pacific Regional Office website.

Operational Significance of 99.9% Performance Criteria (WP/09)

4.5 FIT-Asia Task 3/1 required the Secretariat to seek appropriate expert advice on the operational significance of the 99.9% data link performance criteria, and what could be done in cases of Actual Communication Performance (ACP), Actual Communication Technical Performance (ACTP) and ADS-C Downlink Latency "just" failing to meet the standard.

4.6 The meeting was provided with relevant references from GOLD, and from the *Guidance Material for the Asia/Pacific Region for ADS/CPDLC/AIDC Ground Systems Procurement and Implementation*. These documents provided the relevant specifications for performance measurement against 99.9% probability of the continuity and availability of data-link. The meeting was further informed that GOLD Appendix D paragraph D 2.4.7.5 **Setting guidelines** stated:

> *D.2.4.7.5.1 In airspace where procedural separation is being applied, it has been observed that complete withdrawal of data link may not be required even if performance is observed to fall below the RCP240/RSP180 criteria. While safety services such as reduced separation standards requiring RCP240/RSP180 would be withdrawn the observed performance may still meet RCP/RSP400 criteria and the local safety assessment may also conclude that maintaining the data link connection is viable.*
>
> *D.2.4.7.5.2 Some ANSP have set monitoring guidelines to assist with their data analysis. These include:*
>
> *a) If the performance observed for a fleet by monthly monitoring at the 99.9% level is better than 99.75% then the fleet is considered to meet the 99.9% performance level.*
>
> *b) Observed fleet performance consistently falling below 99.0% will be subject to CRA problem reports and investigation that will attempt to determine the cause of the degradation.*
>
> *c) performance degradation (0.5%) by a fleet below observed historical performance will be subject to investigation.*

4.8 It was noted that these performance monitoring criteria supported the performance objectives of the Asia/Pacific Seamless ATM Plan relating to the implementation of RNP-based separations in Category R [remote, as defined in the Asia/Pacific Seamless ATM Plan] airspace. To further support the performance objectives of the Seamless ATM Plan, and to ensure consistency of performance monitoring, analysis and reporting and CRA problem reporting among FIT-Asia States, the meeting agreed to a Draft Conclusion. The following Draft Conclusion was endorsed by RASMAG/20, for consideration by APANPIRG/26:

> **Draft Conclusion RASMAG/20-2: Data Link Performance Guidelines**
>
> That, FIT-Asia States are urged to:
>
> a) Monitor data link performance against the RCP240 and RSP180 criteria specified in Appendix B of the Global Operational Data Link Document (GOLD); and
>
> b) apply the guidelines specified in the GOLD Appendix D to determine whether fleet performance either:
>
> i. Meets the 99.9% performance level; or
>
> ii. Requires submission of CRA problem reports and/or investigation that will attempt to determine the cause of the degradation.
>
> *Note: Gold Version 2.0 Appendix D Paragraph D.2.4.7.5.2 refers.*

4.9 It was confirmed that the meaning of *fleet* in the template was the aggregate fleet of all data link aircraft operating in the airspace concerned, except only where it related to analysis of individual operator performance.

Agenda Item 5: FIT-Asia Task List

FIT-Asia Task List (WP/08)

5.1 The meeting reviewed the task list, closing 3 tasks and raising 6 new tasks. Two outstanding tasks remained open. The task list as updated by the meeting is provided at **Appendix E** to this report.

Agenda Item 6: Any Other Business

Air Navigation Service Deficiencies Relating to Data Link Performance Monitoring and Analysis (WP/07)

6.1 The Secretariat presented a proposed APANPIRG Air Navigation Service Deficiency in the ATM Field, relating to data link performance monitoring and analysis.

6.2 Air Navigation Deficiencies were raised to share among States information about deficiencies in a transparent manner, and to assist States to define their implementation priorities and to indicate remedial action required. Information on deficiencies from the Air Navigation Deficiencies database is provided to APANPIRG meetings for review under its terms of reference to, *inter alia*, make detailed assessment of the safety impact of the deficiencies as shown and propose remedial action required by States for subsequent review by the Air Navigation Commission and Council.

6.3 Annex 11 to the Convention on Civil Aviation included the following Standard:

> *2.27.5 Any significant safety-related change to the ATS system, including the implementation of a reduced separation minimum or a new procedure, shall only be effected after a safety assessment has demonstrated that an acceptable level of safety will be met and users have been consulted. When appropriate, the responsible authority shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met.*

6.4 In the event that Administrations implemented data-link services without a competent CRA service and a robust program of post-implementation performance monitoring, the service did not comply with the Annex 11 standard. In these cases APANPIRG ANS Deficiencies could be raised.

6.5 As reported in WP/02, 8 FIT-Asia administrations had operationally implemented ADS-C/CPDLC services. Five of those administrations had registered for the FIT-Asia Central Reporting Agency (CRA) service, and three others had a CRA service provided through the South East Asia Safety Monitoring Agency (SEASMA). Continuation of the SEASMA service beyond September 2015 was uncertain.

6.6 Since FIT-Asia/3, one administration had reported problems through the FIT-Asia CRA website facility, and only 3 administrations provided data link performance analysis reports to FIT-Asia/4.

6.7 The FIT-Asia/4 meeting agreed to a Draft Conclusion. The following Draft Conclusion was endorsed by RASMAG/20, for consideration by APANPIRG/26:

Draft Conclusion RASMAG/20-3: ANS Deficiencies Relating to Data Link Performance Monitoring and Analysis

That, an Air Navigation Deficiency should be raised against non-implementation of the provisions of Annex 11 Paragraph 2.27.5 when any FIT-Asia 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.

6.8 The deficiency would be subject to the addition or removal of listed administrations on the basis of the establishment and use of arrangements for the monitoring, analysis and reporting of data link problems and performance, as reported to FIT-Asia.

6.9 The meeting was reminded that Deficiencies raised could be removed from the list at any time up until the week before APANPIRG/26, on receipt by the Secretariat of information on State compliance.

6.10 The meeting agreed to the additions to the Deficiency List at **Appendix F** to the report.

Agenda Item 7: Date and Venue of the Next Meeting

7.1 The next FIT-Asia meeting would be held at a time and venue to be advised.

Closing of the Meeting

8.1 In closing the Meeting, the Chairman thanked delegates for their support and contributions for the duration of the meeting.

RASMAG/20

REPORT ON AGENDA ITEMS – RASMAG/20

Agenda Item 1: Adoption of Agenda

1.1 The provisional agenda (WP01) was adopted by the meeting.

Agenda Item 2: Review Outcomes of Related Meetings

Relevant Meeting Outcomes (WP02)

2.1 The Secretariat provided briefings on the outcomes of relevant meetings, including the:

a) Second Meeting of the APANPIRG Air Traffic Management Sub-Group (ATM/SG/2) was held in Hong Kong, China from 04 to 08 August 2014;

b) Twenty Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/25) was held in Kuala Lumpur, Malaysia, from 08 to 11 September 2014;

c) Fifty First Conference of Directors General of Civil Aviation, Asia and Pacific Regions (DGCA/51) was held at Hong Kong, China from 24 to 26 November 2014;

d) Fifth Meeting of the South Asia/Indian Ocean ATM Coordination Group (SAIOACG/5) and Twenty-Second Meeting of the South-East Asia ATM Coordination Group (SEACG/22) were held at Bangkok, Thailand from 03 to 06 March and from 09 to 12 March respectively; and

e) APANPIRG Contributory Bodies Structure Review Task Force (ABSRTF) pre-meeting discussion teleconference, which took place on 08 April 2015 (the Second Meeting of the ABSRTF would take place from 24 to 25 June 2015).

RASMAG/MAWG/2 Report (IP02)

2.2 Topics discussed by the meeting included:

a) Automatic Dependent Surveillance-Broadcast (ADS-B) height-keeping monitoring regarding the Height Above Ellipsoid (HAE) requirement to be made explicit in relevant global technical requirements so that the States and Regional Monitoring Agencies (RMAs) can provide standardised height-keeping performance monitoring to operators using ADS-B data;

b) China RMA's successful implementation of ADS-B height-keeping monitoring and clarification of their large height deviation (LHD) reporting and risk estimation issues;

c) comparative height-keeping monitoring outputs between different RMAs and systems, particularly between the Japan Airspace Safety Monitoring Agency (JASMA) using Height Monitoring Units (HMUs) and the Monitoring Agency for Asia Region (MAAR) using their ADS-B Based Height Monitoring System (AHMS);

d) development of guidance material on the correct reporting of Category E LHDs;

e) development of a consolidated report from the RMAs of comparisons between the monitoring data, to demonstrate the effectiveness by which the RMAs are using data from across the region to validate monitoring results;

f) assessment of En-route Monitoring Agency (EMA) future roles in relation to the future implementation of performance-based communication and surveillance (PBCS) stemming from changes to ICAO documents such as Annex 6, Annex 11, Annex 15, Doc 4444 (PANS-ATM) and Doc 8400 (PANS-ABC), and Doc 9869 (PBCS Manual);

g) review of the GPAT and agreement to provide access to all Asia/Pacific EMAs;

h) review of the Minimum Monitoring Requirements (MMR) for Reduced Vertical Separation Minimum (RVSM); and

i) ongoing review of non-RVSM approved airframes.

FIT/Asia/3 (Flimsy 1)

2.3 A FIT-Asia/4 meeting report was provided to RASMAG/20 as Flimsy 1.

Agenda Item 3: Reports from Asia/Pacific RMAs and EMAs

AAMA Safety Report (WP03)

3.1 Australia presented the results of RVSM safety assessments undertaken by the Australian Airspace Monitoring Agency (AAMA) for the twelve month period ending 31 December 2014.

3.2 The report showed that for the Australian (Brisbane, Melbourne), Nauru, Papua New Guinea (Port Moresby) and Solomon Islands (Honiara) Flight Information Regions (FIRs), the Target Level of Safety (TLS) was met with a risk assessment of **3.01 x 10^{-9}** (TLS, 5.0 x 10^{-9}). **Figure 4** presents the collision risk estimate trends for Australian, Nauru, Papua New Guinea and Solomon Islands airspace.

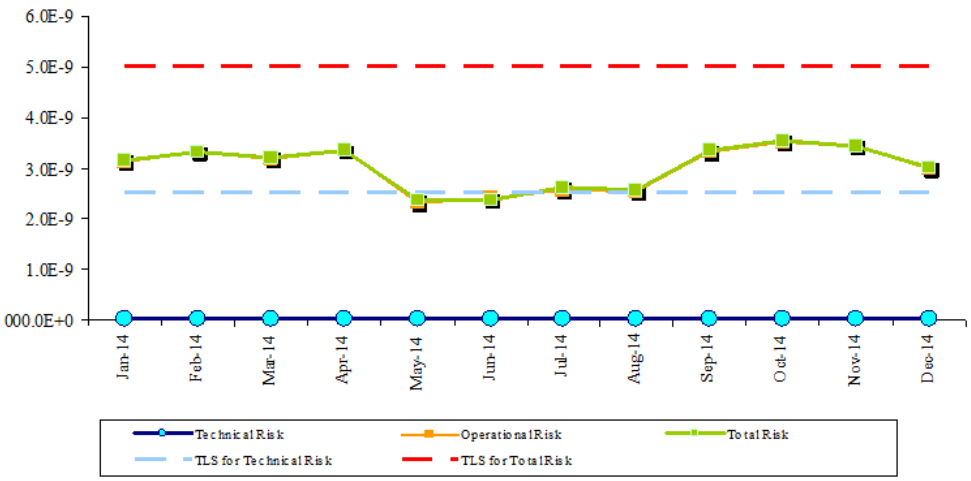

Figure 4: Australian, Nauru, PNG and Solomon Islands Airspace Risk Estimate Trends

3.3 In the Australian, Nauru, Papua New Guinea and Solomon Islands airspace, the AAMA reported that there been a total of 28 occurrences of pilots climbing or descending an aircraft not in accordance with the clearance (n=11) or without a clearance (n=17). The occurrences involved a range of operators and locations and there did not appear to be any underlying common factor.

3.4 Regarding Indonesian airspace, the TLS was met for the reporting period (**2.18 x 10^{-9}**). **Figure 5** presents collision risk estimate trends from 01 January 2013 to 31 December 2014.

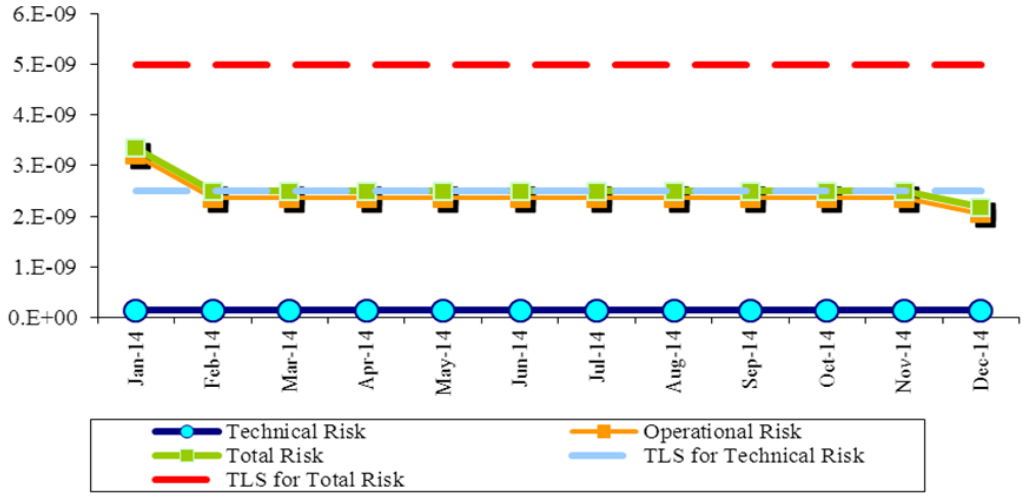

Figure 5: Indonesian Airspace RVSM Risk Estimate Trends

3.5 AAMA noted a significant grouping of Category E (ATC coordination error) LHDs on the Jakarta/Ujung Pandang FIR boundary, a majority of which were attributed to Jakarta Area Control Centre (ACC), with either no coordination being provided to the adjacent FIR or incorrect information provided.

3.6 AAMA advised that there had been difficulties receiving reports from Papua New Guinea, but this had been resolved. The AAMA commented that there were also difficulties receiving LHDs from Indonesia during 2014, with reports being significantly delayed. However these issues had now been rectified. Additionally the AAMA had been unable to resolve a number of data issues related to the 2014 Traffic Sample Data (TSD) but was hopeful in finalising the TSD in the next few months.

China RMA Safety Report (WP04)

3.7 China presented the airspace safety oversight results for RVSM in the airspace of Chinese FIRs and the Pyongyang FIR (Democratic Republic of Korea – DPRK) during 2014. The estimates of technical and total risks for the airspace of Chinese FIRs exceeded the TLS of 5.0 x 10^{-9} fatal accidents per flight hour, with an overall risk estimate of **5.50 x 10^{-9}**. **Figure 6** presents collision risk estimate trends for the Chinese FIRs.

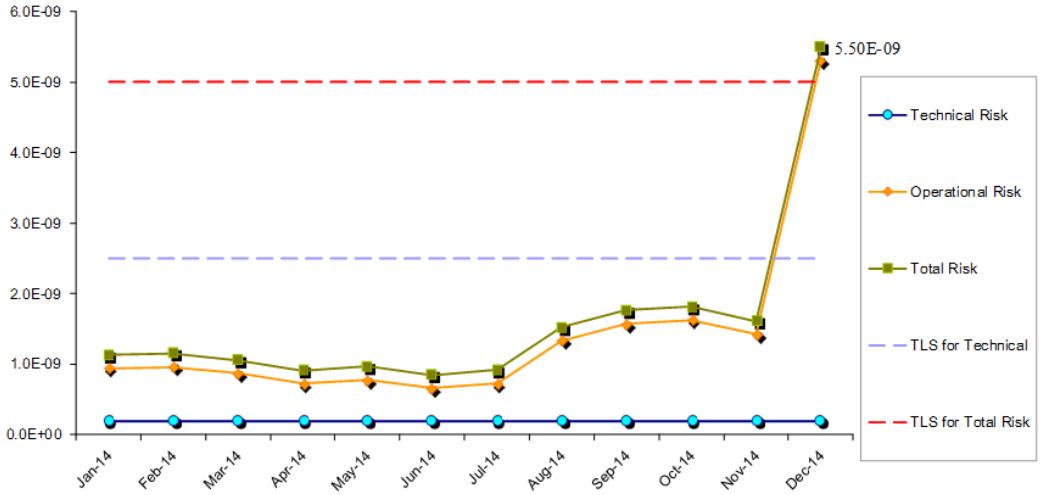

Figure 6: Chinese FIRs RVSM Risk Estimate Trends

3.8 China RMA noted that in 2014 a number of Category E LHDs were not reported by domestic ATC. China RMA conducted an intensive investigation into the causes leading to lack of reporting. In the second half of 2014, China RMA took action to improve LHD reporting in China with workshops in all regional centres, updating training material and simplifying the LHD reporting template. China RMA reported that the situation was improving and would provide further updates to RASMAG/21 meetings.

3.9 China recalled the LHD 'hot spot near the China – Pakistan border. They informed the meeting about progress made to improve the Air Traffic Services (ATS) communication and surveillance capability in this area.

3.10 Additionally, China RMA conducted monthly risk assessments as done by a number of other Asia/Pacific RMAs, and also analysed the contribution of operational risk for each non-nil event to the total risk. A high risk event in December 2014 was a Category M LHD which was the result of a failure to establish communication between controller and pilot. The duration of the occurrence was assessed as 26 minutes.

3.11 The estimate by China RMA of the overall vertical collision risk for the Pyongyang FIR was **1.58 x 10^{-9}** fatal accidents per flight hour, which satisfied the TLS. Based on data from the DPRK, no LHD had occurred during 2014 within the Pyongyang FIR.

3.12 **Figure 7** presents collision risk estimate trends for DPRK airspace.

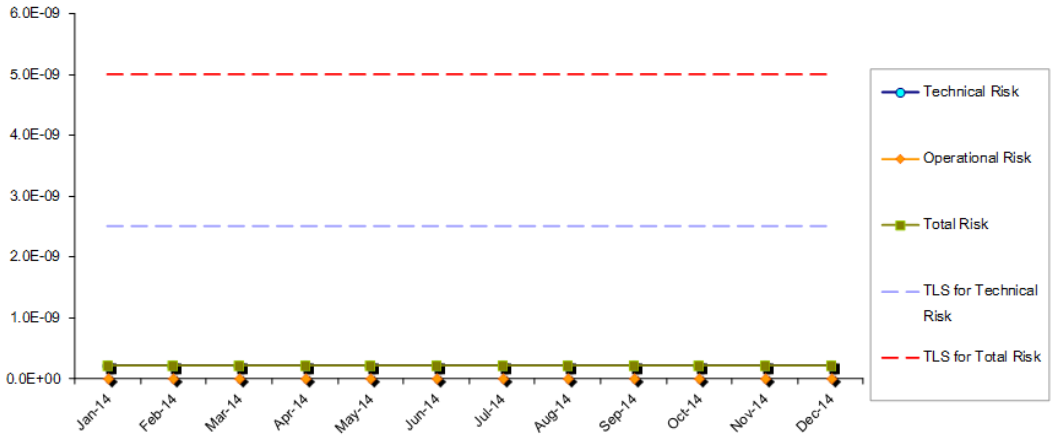

Figure 7: DPRK Airspace RVSM Risk Estimate Trends

3.13 The meeting discussed the estimated flight hours indicated for Chinese airspace, noting that there was a large discrepancy between the figure used in 2013 and 2014, which indicated a 16% decline to 2,124,690 hours. China explained that previously, there had been some modelling errors caused by the tool that was being used, and now the estimate was correct.

3.14 The meeting noted with appreciation the work of China RMA to improve the reporting regime within China, while China thanked the ICAO Regional Office for its efforts to highlight this issue at RASMAG/19.

JASMA Vertical Safety Report (WP05)

3.15 Japan presented the results of the airspace safety assessment of the Fukuoka FIR by the JASMA. The report showed that the Fukuoka FIR did not meet the TLS, with the assessed risk calculated as **7.17 x 10^{-9}**. **Figure 8** presents collision risk estimate trends during 2014.

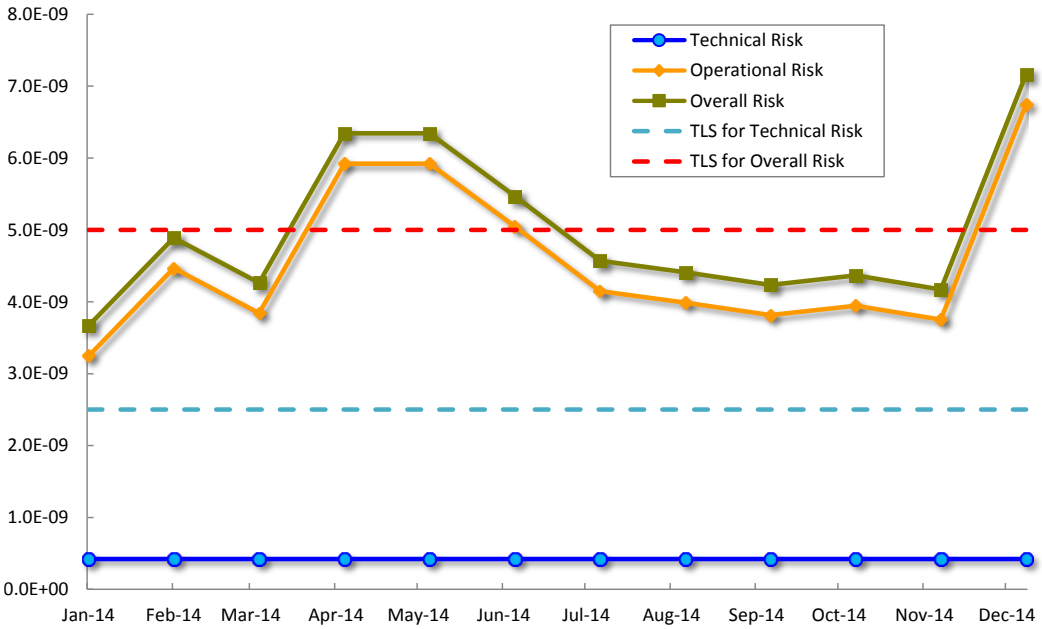

Figure 8: Fukuoka FIR RVSM Risk Estimate Trends

3.16 The Chairman thanked JASMA for the detailed report and noted the group of Traffic Collision Avoidance System (TCAS) occurrences in the south-west of the airspace and asked if there anything significant in relation to these occurrences. JASMA advised that they are undertaking a review of TCAS occurrences and will provide outcomes to a future RASMAG meeting. ICAO noted the number of Category E errors in the south-west area of the FIR which is a critical piece of airspace with high traffic densities. JASMA reported that they were investigating these occurrences with the relevant ACC.

MAAR Safety Report (WP06)

3.17 The MAAR provided the results of the airspace safety oversight for the RVSM operation in the Bay of Bengal (BOB), Western Pacific/South China Sea (WPAC/SCS), and Mongolian airspace for 2014.

3.18 The BOB RVSM airspace overall risk was estimated to be **18.73 x 10^{-9}**, which did not meet the TLS by a substantial margin. This represented a major increase in apparent risk, which was probably caused by improved reporting. The MAAR stated that the Transfer of Control (TOC) points between the Chennai and Kuala Lumpur FIRs remained the most prominent hot spots in the region. They noted that there had been a series of ATS Inter-Facility Data Link Communications (AIDC) trials between Chennai and Kuala Lumpur FIRs, but it was unclear when this technology would become operational.

3.19 **Figure 9** presents collision risk estimate trends during 2014.

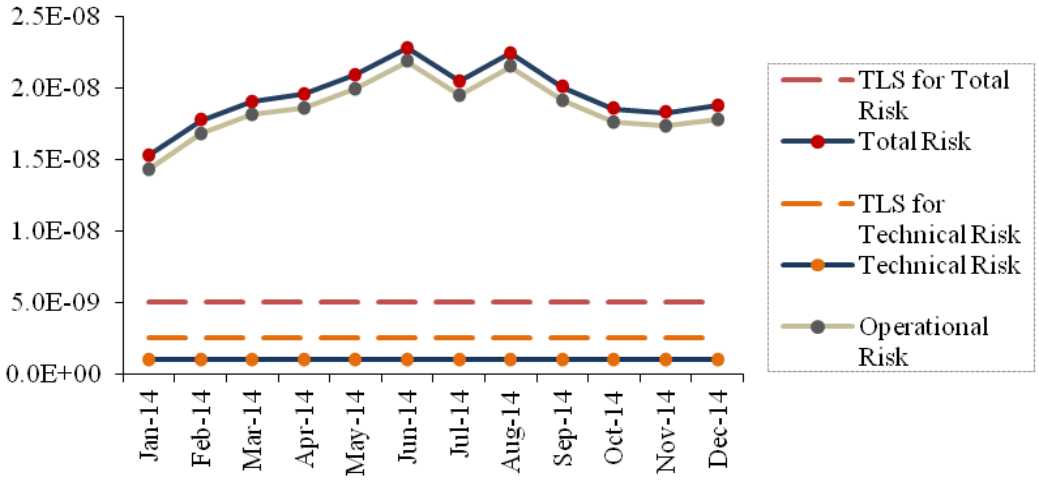

Figure 9: BOB Airspace RVSM Risk Estimate Trends

3.20 In relation to some of the other hotspots identified in the report, the Chairman referred to GADER and sought information of what had changed to reduce the numbers of LHDs so significantly. The Secretariat advised that it probably had been influenced by the new Flight Level Allocation Scheme (FLAS) that has been introduced in Iranian airspace. This resulted in a significant change as controller workload has been reduced and as a result coordination errors had reduced. India advised that in an effort to resolve the hotspots to the east of the airspace, an AIDC trial will start between India and Malaysia in the near future and that a ADS-B data sharing agreement has been signed with Myanmar which should help reduce LHDs.

3.21 The WPAC/SCS RVSM airspace total risk was estimated to be **4.14 x 10^{-9}**, which met the TLS. **Figure 10** presents collision risk estimate trends during 2014. The meeting recognised that this was an improvement in safety performance since 2013.

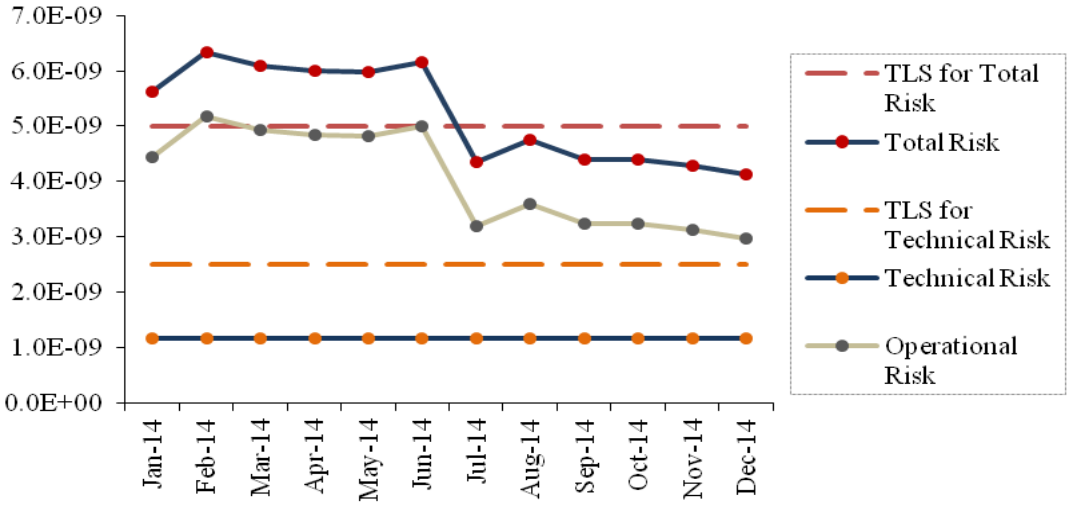

Figure 10: WPAC/SCS Airspace RVSM Risk Estimate Trends

3.22 Regarding the WPAC/SCS airspace, NOMAN and SABNO TOC points along the Hong Kong - Manila FIR boundary were the main hot spots. The number of occurrences at DOTMI on the Guangzhou/Hong Kong FIR boundary (all incorrect transfers occurred from China) and OSANU on the Manila/Kota Kinabalu FIR interface (most from flights being transferred from the Philippines) were relatively high. However the LHD durations were low since the accepting ATS units had radar surveillance, but this increased controller workload and still entailed unnecessary risk.

3.23 Even though the overall risk is below the TLS, the Philippines, Hong Kong, and Malaysia should still prioritize AIDC implementations between Hong Kong – Manila FIRs and Kota Kinabalu – Manila FIRs.

3.24 The Mongolian RVSM airspace total risk was estimated at **2.98 x 10^{-9}**, which met the TLS and represented a major advance on 2013's results. RASMAG/20 recalled the positive effect of ATS surveillance in reducing risk within the Ulaanbaatar FIR by allowing rapid intervention, allowing less exposure to risk-bearing events. Due to the high number of LHD occurrences near NIXAL and INTIK, Mongolia had extended Secondary Surveillance Radar (SSR) coverage by about 30NM beyond its FIR boundary since December 2014.

3.25 **Figure 11** presented collision risk estimate trends for 2014.

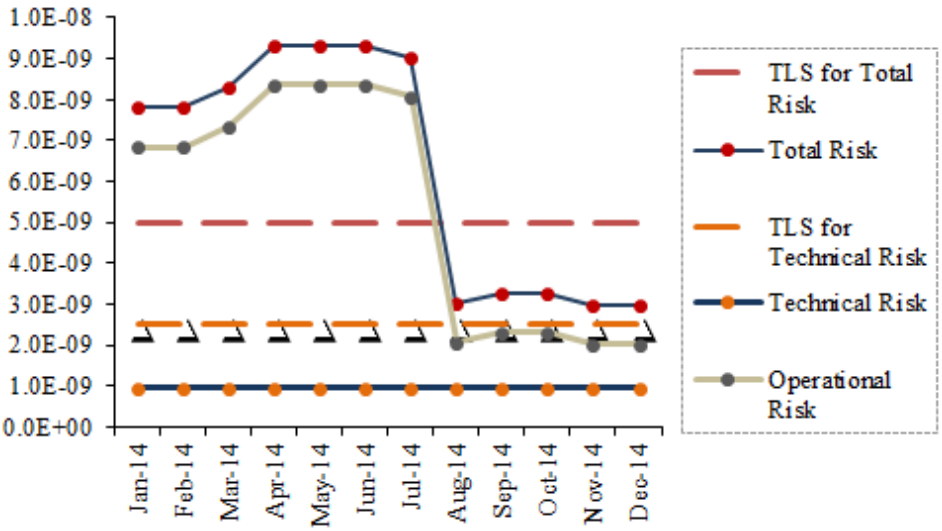

Figure 11: Mongolian Airspace RVSM Risk Estimate Trends

PARMO Vertical Safety Report (WP07)

3.26 The Pacific Approvals Registry and Monitoring Organization (PARMO) presented a safety assessment of RVSM for the Pacific and the Republic of Korea's (ROK) airspace for 2014. The Pacific airspace total risk was estimated to be **3.86 x 10^{-9}**, which met the TLS and was a major reduction from the 2013 estimated risk. **Figure 12** presents collision risk estimate trends during 2014.

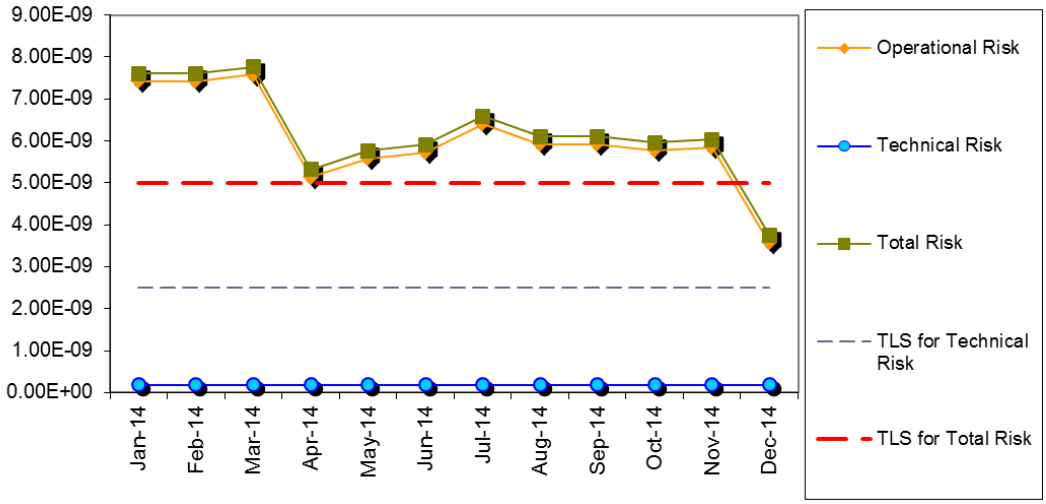

Figure 12: Pacific Airspace RVSM Risk Estimate Trends

3.27 RASMAG/20 noted that although an increase in the number of non-nil LHD reports to 37 LHDs (most being Category B: flight crew climbing /descending without ATC clearance) was observed from 2013 to 2014, a significant decrease in the reported time spent at incorrect flight levels was also reported (239 minutes versus 88 minutes), reducing risk levels.

3.28 PARMO advised that the December TSD had not been received from the Nadi FIR for 2013 or 2014 prior to the meeting, but it was received during RASMAG/20.

3.29 The Incheon FIR RVSM total risk was estimated to be **4.13 x 10^{-9}**, which met the TLS. **Figure 13** presents collision risk estimate trends during 2014.

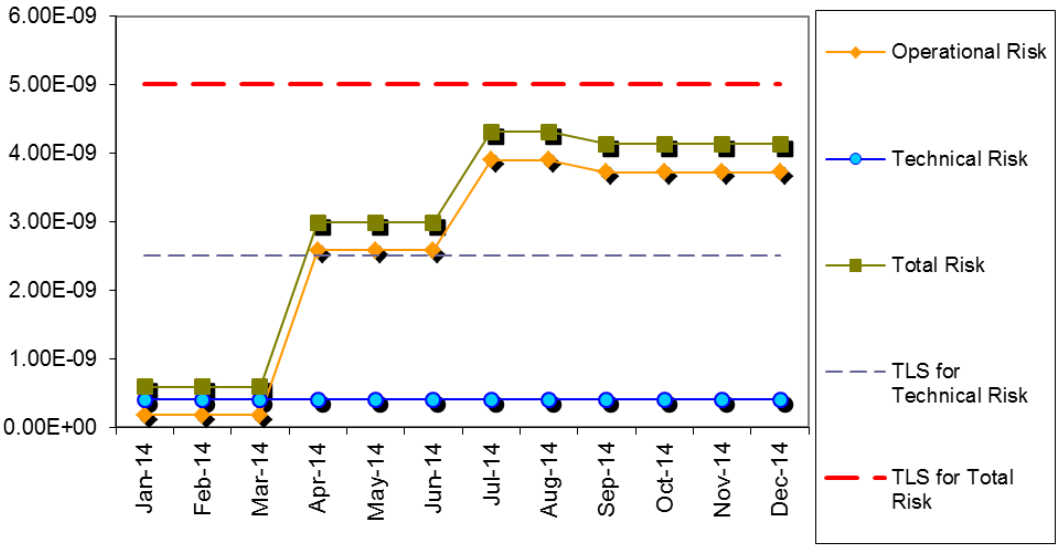

Figure 13: ROK Airspace RVSM Risk Estimate Trends

PARMO Horizontal Safety Report (WP08)

3.30 The USA presented the horizontal safety monitoring report for the Anchorage and Oakland FIRs for 2014. The report contained a summary of Large Longitudinal Errors (LLE) and Large Lateral Deviations (LLD) received by the PARMO.

3.31 The Anchorage and Oakland oceanic airspace horizontal risk estimates all comfortably met the 5.0 x 10^{-9} TLS with lateral risk estimated at **1.35 x 10^{-9}** (50NM) and **0.53 x 10^{-9}** (30NM) and longitudinal risk at **2.32 x 10^{-9}** (50NM) and **3.74 x 10^{-9}** (30NM). A summary of risk estimates for all EMAs is at RASMAG/20/WP24.

3.32 In November 2013, analysis was conducted on when an updated forward estimate of position was not provided. During the automated tracking, 109 time error events were identified. Most of these events involved operations using HF radio for communication and were not eligible for the use of 50NM and 30NM longitudinal separation minima. As a result of this activity, improvement had been observed with a few operators. In April 2014, the Federal Aviation Administration (FAA) and ARINC initiated new procedures, which included HF radio read-backs. A 50% decrease in the number of time events was observed from January 2014 to December 2014.

BOBASMA Safety Report (WP09)

3.33 India presented the horizontal safety monitoring report of the Bay of Bengal Arabian Sea Monitoring Agency (BOBASMA) for 2014. The results of the safety assessment confirmed that the TLS was easily satisfied at **1.08 x 10^{-9}** (lateral), **1.60 x 10^{-9}** (50NM longitudinal) and **0.13 x 10^{-9}** (30NM longitudinal).

3.34 BOBASMSA informed the RASMAG/20 that a Category A LLD that occurred in August 2014 within the Mumbai FIR was due to an eastbound flight deviating more than 15NM due to extensive thunderstorm clouds without ATC clearance, after the pilot was unable to contact ATC to obtain clearance prior to the deviation.

JASMA Horizontal Safety Report (WP10)

3.35 Japan provided the results of the horizontal airspace safety assessment by JASMA of the time-based longitudinal, distance-based longitudinal and lateral collision risk within the Fukuoka FIR. The calculations yielded an overall safety estimate result of **0.751 x 10^{-9}** (50NM lateral) and **0.000578 x 10^{-9}** (30 NM longitudinal), which achieved TLS.

3.36 JASMA reported the cause of a Category B LLD as being mismatched flight plans between that loaded into the aircraft Flight Management System (FMS) and the version used by ATC, which caused the flight to enter the Oakland FIR instead of the Anchorage FIR before the error was identified.

SEASMA Safety Report (WP11)

3.37 Singapore provided the horizontal safety assessment report from the South East Asia Safety Monitoring Agency (SEASMA) for operations on the six major ATS routes within the SCS in 2014. The assessment concluded that the TLS was conservatively satisfied for the lateral (**0.045 x 10^{-9}**) and longitudinal (**0.034 x 10^{-9}**) separation standards.

3.38 SEASMA noted that all seven reported LLD/LLE occurred as a result of Category E ATC coordination errors (human error).

ATS Routes A461 and A583 Horizontal Safety Assessment (WP12)

3.39 Singapore provided details of the airspace safety assessment for the proposed implementation of 50NM separation minima on ATS routes A461 and A583 between Hong Kong, China and the Philippines. The proposed implementation met the TLS, with the estimated risks being **0.002 x 10^{-9}** (lateral) and **2.998 x 10^{-9}** (longitudinal). As the navigation performance of the aircraft would affect the collision risk, there was a need to set up a programme to monitor this.

3.40 In response to a question from IATA, the Philippines confirmed that the implementation of ADS-C and CPDLC within the Manila FIR would cover the non-surveilled areas of the routes concerned, and provide better efficiency. The operational trial for ADS-C and CPDLC would begin within the Manila FIR in early June 2015.

3.41 PARMO commented that in relation to the collision risk model used for longitudinal risk, there are two models available namely the Hsu and the Reich model. The two models compare favourably but use slightly different data. It was stated that for monitoring agencies either of these models could be used and the choice would be dependent on the data that was available.

Agenda Item 4: Airspace Safety Monitoring Documentation and Regional Guidance Material

Development of Global ICAO Manual on PBHSN (WP13)

4.1 Australia and the USA provided advance information on the new *Manual on Monitoring the Application of Performance-Based Horizontal Separation Minima* (PBHSM) proposed by the Separation and Airspace Safety Panel (SASP) as global guidance. This material is intended to globally standardise data and intelligence sharing. It was also envisaged that identification of common risks, currently based on a small set of event data, could be enhanced by providing access to a standardized and wider data set, facilitated by compatible monitoring operations.

4.2 The USA confirmed that although this manual did not reference the term 'EMAs', it would not invalidate the Asia/Pacific usage; however, when the manual was endorsed the Asia/Pacific EMA Manual would have to be deleted from the Asia/Pacific website, otherwise there would be two different reference documents.

4.3 The Chairman encouraged the meeting to review the manual and provide any feedback to PARMO or AAMA at the earliest opportunity.

Agenda Item 5: Airspace Safety Monitoring Activities/Requirements in the Asia/Pacific Region

AAMA Assessment of Non-RVSM Approved Aircraft (WP14)

5.1 Australia identified eight individual airframes in the data set assessment, with airframes from Australia showing the highest number (3). The overall results showed a significant positive trend, compared to the results presented at RMACG/9 (where 90 airframes were identified representing 11 States of Registry).

5.2 Australia suggested the following policy definition of a 'non-RVSM approved' aircraft for the purposes of identification to the RASMAG and RMACG by RMAs, which sought to avoid problems from a slow approval process or an accidental flight plan. Australia suggested that a 'non-RVSM approved' aircraft was one that was confirmed as not having a current approval over a long period of time:

a) during the last four months; and

b) more than five months ago.

China RMA Assessment of Non-RVSM Approved Aircraft (WP15)

5.3 WP15 provided the results of a monthly comparison between the RMA approval databases and flight plans operated within the RVSM airspace of Chinese FIRs and Pyongyang FIR (using flight plan data up to April 2015). China RMA stated that experience had shown that the primary reason for failure to match operations and approvals was a delay in notification of the approval status of operators to the appropriate RMA. However, there were also cases that the aircraft are confirmed to be non-approved or had an expired approval. The largest numbers of Asia/Pacific airframes identified as non-RVSM were from the ROK (5), Cambodia (3) and Malaysia (3).

JASMA Assessment of Non-RVSM Approved Aircraft (WP16)

5.4 JASMA examined approximately 90,000 to 95,000 flight plans of aircraft entering RVSM airspace comparing this data with the global RMA's latest approval databases uploaded to the Knowledge Sharing Network (KSN) website every month. JASMA had identified 15 airframes which had been flying within Fukuoka FIR RVSM airspace with a 'W' on their flight plans, but without registration in the KSN database for a considerable length of time. The main States of registration for such flights were the Philippines (3), Malaysia (2) and ROK (2).

MAAR Assessment of Non-RVSM Approved Aircraft (WP17)

5.5 At the time of developing WP17, MAAR found a total of 203 aircraft registrations operating within RVSM airspace without proof of valid RVSM approval. The highest representation of Asia/Pacific States in this data was from India (73), Thailand (10) and Malaysia (7). MAAR found that of the 203 aircraft registrations operating within the RVSM airspace without proof of valid RVSM approval, 29 were detected in previous flight plans and nine were State/Military aircraft.

5.6 The meeting discussed the need for India and the Philippines to provide RVSM Approval Data to MAAR in a timely manner and to assist with that process BOBASMA offered to coordinate directly with the Indian DGCA. The offer was accepted by MAAR.

PARMO Assessment of Non-RVSM Approved Aircraft (WP18)

5.7 PARMO advised that all civil aircraft operations observed in each of the December 2014 traffic samples were compiled into one master traffic sample, or superset, consisting of approximately 36,000 operations. The superset was compared against the collective approvals database as of 31 January 2015. After a verification process, a total of 45 civilian operations from eight States remained on the list of non-approved operations within the PARMO area of responsibility (three from Australia).

5.8 The Chairman thanked PARMO for the difficult scrutiny activity undertaken to compile the non-approved list and commented that the RMACG/10 meeting had discussed the effectiveness of undertaking reporting of this nature to RMACG and RASMAG. The difficulty was for those RMAs reliant on annual TSD to enable the checks to be completed. The Chairman noted that in many cases by the time the reports reached the relevant groups for review the data was well out of date. As a result the RMACG had decided not to require further reporting by RMAs unless some negative trends were identified in the normal course of RMA scrutiny activity. In response, ICAO commented in the Asia/Pacific region there were still some significant issues in relation to non-approved operators and that APANPIRG should be kept informed at least in the short-term. To that end, it was agreed that reporting would continue to the RASMAG.

Non-RVSM Aircraft Reporting Templates (WP25)

5.9 Thailand and Australia proposed the use of standardized report templates for use by Asia/Pacific RMAs to report identified aircraft operating without RVSM approvals, which had been developed by the MAAR and reviewed by the RASMAG/MAWG/2. The meeting noted that WP25 Appendix A should reflect the APANPIRG Conclusion 24/6:

Conclusion 24/26: Repetitive Non-RVSM Approved Aircraft Operating as RVSM Approved Flights

That, Asia/Pacific States should, except where a specific non-RVSM operation is authorised, deny entry to operate within RVSM airspace for aircraft that have been confirmed as non-RVSM approved over a significant length of time, or by intensive checking.

5.10 China asked about the frequency that Appendix B (RMA information template) should be used. The meeting was advised that this was flexible, dependent on the capability of the RMA. The meeting provided feedback on format and content to the Chair, who amended the templates and provided them as **Flimsy 02** and **Flimsy 03** for use by Asia/Pacific RMAs.

AAMA LTHM Burden Estimate Update (WP19)

5.11 The AAMA determined that the number of RVSM approved aircraft totalled 1,128 as at May 2015. This represents an increase of 100 aircraft since the last report at RASMAG/19 in May 2014. Applying the MMR to the total of approved aircraft resulted in a total monitoring burden of 334 aircraft. Taking into account the aircraft that had already successfully monitored, the current outstanding burden was 113 aircraft, an increase of 34 airframes from that reported to RASMAG/19 in 2014.

5.12 The existing burden comprised 37 Australian registered, 73 Indonesian registered and one Papua New Guinea registered aircraft. The AAMA expects that nearly all of the Australian registered aircraft will be monitored in the medium term as the ADS-B mandate takes effect (approximately 96% of all Australian registered RVSM approved aircraft had been monitored using the AHMS).

China RMA LTHM Burden Estimate Update (WP20)

5.13 China stated that the monitoring burden list of China RMA had risen rapidly from 51 operators with 2,367 aircraft (biennial monitoring total 252) in 2014 to 61 operators with 2,608 aircraft by the end of March, 2015. China RMA had been using two sets of Enhanced Global Positioning System (GPS)-based Monitoring Unit (EGMU) to conduct on-board monitoring for Chinese airlines. Since 2014, China RMA started to use AHMS to augment its monitoring programme.

5.14 For the DPRK, China reported that there were 10 aircraft and the biennial monitoring number was three.

JASMA LTHM Burden Estimate Update (WP21)

5.15 Japan informed the meeting that the total number of RVSM approved airframes was 727 as of 20 April, 2015. Applying the MMR, the total monitoring burden was 139 airframes. Taking into account the aircraft already successfully monitored, the current outstanding burden was 14 airframes. The Chairman acknowledged the very effective monitoring program initiated by Japan.

MAAR LTHM Burden Estimate Update (WP22)

5.16 MAAR undertook its monitoring programs using a Global Positioning System-based Monitoring Unit (GMU) and an AHMS, with ADS-B data from Bangkok and Taipei FIRs. The resultant monitoring burden for 2,230 approved aircraft from the 21 MAAR States was 638 airframes. As at 01 May 2015, there were 169 airframes remaining to be monitored, a decrease of 31 airframes compared to the same period last year.

5.17 **Figure 14** illustrated the high total remaining monitoring burden as a result of new operators in Thailand and India. Thailand had fulfilled 59% of its total monitoring burden, but 75% of its monitoring burden (27 airframes) was associated with 23 general aviation operators. Though over 81% of India's total burden had been fulfilled, 25 operators accounted for the remaining monitoring burden of 33. Since no annual RVSM approvals update was received from India, MAAR suspected that some of these operators may have ceased operations but their aircraft were never removed from the approvals list.

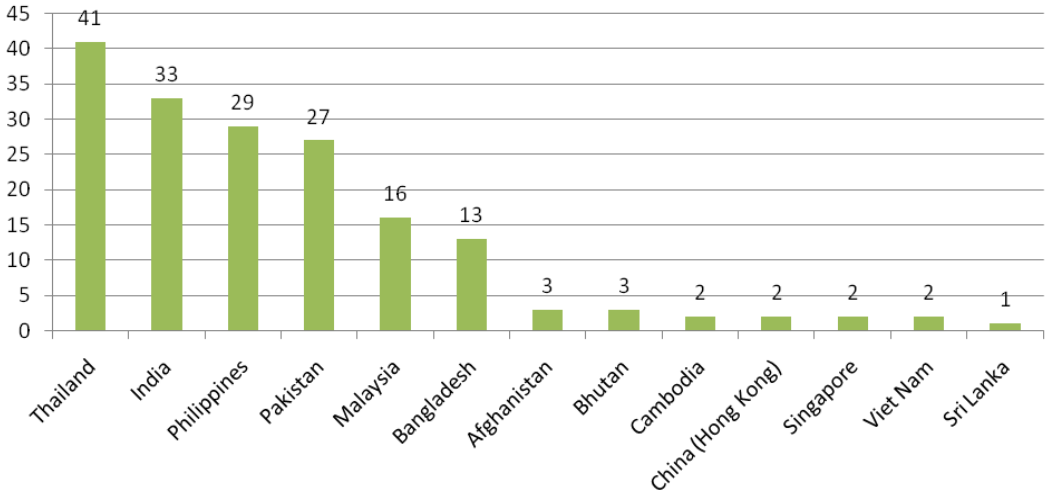

Figure 14: Remaining Monitoring Burden

5.18 MAAR emphasised the sharing of ADS-B data as a means of height monitoring, and informed that many operators were still not aware of their LTHM obligations and they encouraged all States to provide this information to operators.

5.19 Pakistan and the Philippines had relatively high remaining monitoring burdens at 66% and 48% respectively (Bangladesh informed the meeting that their burden would be resolved shortly). ICAO offered to assist MAAR in resolving communications with Pakistan to help reduce the remaining monitoring burden if required.

PARMO LTHM Burden Estimate Update (WP23)

5.20 PARMO's Long Term Height Monitoring (LTHM) monitoring burden of 20 resulted from a total of 510 airframes with RVSM approval**.** The ROK (11) and New Zealand (7) accounted for the majority of these aircraft.

Regional Safety Monitoring Assessment (WP24)

5.21 ICAO presented an overview of safety assessment results from a regional perspective. **Figure 15** indicated the status as reported to RASMAG/20.

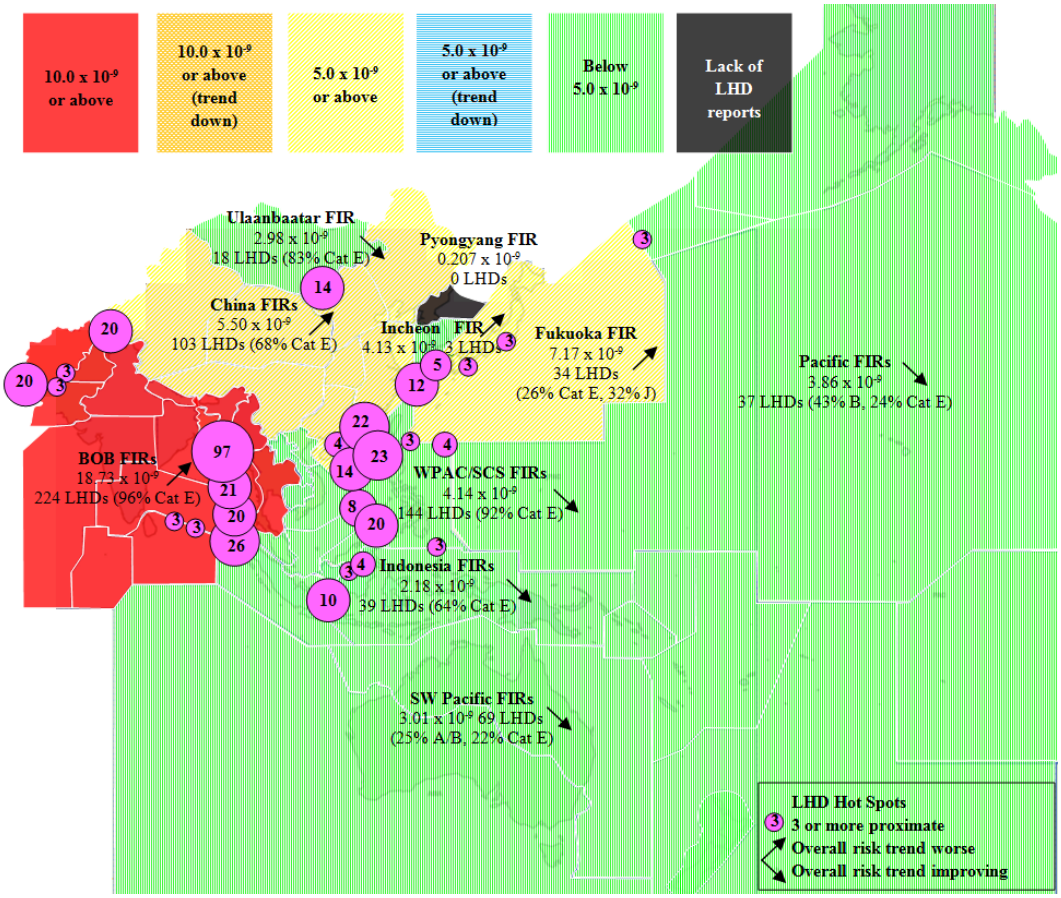

Figure 15: Asia/Pacific TLS compliance reported to RASMAG/20

5.22 **Figures 15** indicated the following sub-regional regional trends.

- **South Asia**: the improved reporting by India has resulted in a further significant degradation in the Bay of Bengal (BOB) safety risk assessment to reflect the true safety performance that had been hidden – one that greatly exceeded the TLS and remained the Asia/Pacific's highest risk area. However, the States concerned were taking a number of ATM improvement actions that were expected to substantially reduce risk during 2015 and 2016 when the new systems were implemented (however, there was no confirmation as to when the new communications and surveillance systems on Great Nicobar Island would be operational).

  While the increased reporting at Indian FIR boundary TOC points was laudable, it appeared unlikely that there could be no LHDs as reported within Indian continental airspace; thus further work was necessary to sensitise ATC to an appropriate reporting culture.

  There were a number of hot spots evident on the Kabul FIR boundary, most notably at position GADER (between the Tehran and Kabul FIRs); however since late 2014 these LHDs had markedly reduced after intervention by MAAR in coordination with the ICAO Middle East (MID) Region.

- **Southeast Asia** reflected an overall improvement in safety risk, even with an increase in reported LHDs. The Philippines airspace remained a major concern, with numerous LHDs evident at all points along the Manila FIR boundary. The greater use of AIDC and ATS surveillance in the South China Sea, and an ATM system upgrade for the Manila FIR continued to require a priority focus.

- **East Asia**: China recorded a dramatic increase in reported LHDs, resulting in its airspace being well over TLS. This reflected a much improved reporting culture, fostered by the efforts of the China RMA. Other than the known hot spots between Pakistan and Chinese airspace near PURPA and between Mongolia and China near NIXAL, new hot spots were revealed between Shanghai/Taibei, Guangzhou/Hong Kong and Sanya/Hong Kong FIRs. China had made significant progress in addressing the PURPA hot spot by improving the communication and surveillance capabilities in this area.

  Attention to the other hot spots in the congested airspace of Eastern China was also required, particularly as these were mainly operational ATC errors in general that could be improved with the use of AIDC and more robust procedures (note: the volume of occurrences between Hong Kong and the Sanya/ Guangzhou FIRs may require an urgent focus on such matters as airspace dimensions, ATS route structures, Flight Level Allocation Scheme (FLAS), ATS coordination procedures and the management of the aerodromes within the Pearl River Delta using a 'metroplex' planning methodology).

  Mongolian airspace observed a downward trend in risk, despite a doubling of the reported LHDs – mainly due to the improved intervention capability using ATS surveillance (note: there were several LHDs reported in MAAR's analysis of the Ulaanbaatar/Beijing FIR boundary at NIXAL and INTIK which do not appear to have been reported to the China RMA; thus the work on improving the reporting culture within China should continue)

  The Pyongyang FIR continued to record no LHDs, which was statistically possible, given the low estimated flight hours. However, no LHDs had been reported for many years; thus it was likely that there was a lack of reporting culture within this airspace, despite China's past efforts to sensitise DPRK ATC.

  Japanese airspace had shown a marked upward (worsening) risk trend; despite the number of LHDs reducing (this was assumed to be due to the longer duration of the LHDs). The significant number of ATC interface errors with the Incheon FIR was concerning, as this was related to the 'AKARA' corridor. The corridor was, a complex airspace serving very high density traffic between China and Japan, and the ROK and the Taibei FIR that used a FLAS, with multiple frequencies and control authorities in the same area. It would appear to be necessary for the involved administrations to urgently review this airspace and its associated procedures (note: AIDC was being used between the ROK and Japan).

- **Southwest Pacific**: all FIRs showed a downward trend, with significant improvement in the performance of Indonesian airspace. However some caution was necessary, as there had still been major interface issues between the Jakarta and Ujung Pandang FIRs, and reporting had been a problem in the past in this airspace. In summary, the result indicated a positive safety result from the efforts of the AAMA, regulators and ANSPs in the FIRs concerned, although Indonesia needed continued focus on its internal improvement programme (note: there were several LHDs reported in MAAR's analysis of the Kota Kinabalu/Jakarta FIR boundary which do not appear to have been reported to AAMA).

- **Pacific**: the Pacific showed a significant risk improvement, even though the number of LHDs more than doubled (mainly occurring in the high density North Pacific Organised Track System (NOPAC) and Hawaiian route system). .

5.23 The Regional analysis of 'hot spots' indicated a number of priority high risk areas where APANPIRG needed to take specific action, in order to reduce risk to an acceptable level. Notwithstanding the establishment of the Asia/Pacific ATS Inter-facility Data Link Communication Implementation Task Force (APA TF/1) and on-going ATM improvement programmes designed to enhance the capability of ATC, RASMAG/20 agreed to the following Draft Conclusion related to Special Coordination Meetings (SCM) in order of assumed risk (as presented to RASMAG) to ensure an urgent reduction of risk:

Draft Conclusion RASMAG/20-4: Asia/Pacific LHD Hot Spot Action Plans

That, the following Regional Monitoring Agencies (RMAs), States and ATC units should take urgent action* to establish a scrutiny group or an alternate means to address the following Large Height Deviation (LHD) hot spot areas and present Action Plans and details of progress made to the ICAO Regional Office, prior to 01 January 2016:

f) **MAAR**, India, Myanmar and Malaysia – Kolkata/Chennai FIRs interface with Yangon/Kuala Lumpur FIRs;

g) **PARMO**, China RMA, JASMA, MAAR, China, Japan, Republic of Korea and Taibei Area Control Centre (ACC) – Incheon FIR AKARA Corridor interface with Shanghai/Fukuoka/Taibei FIRs;

h) **China RMA**, MAAR, China and Hong Kong China– Hong Kong FIR interface with Guangzhou/Sanya FIRs;

i) **MAAR**, AAMA, JASMA, Hong Kong China, Indonesia, Japan and the Philippines – Manila FIR interface with Fukuoka/Hong Kong China/ Singapore/Ujung Pandang FIRs; and

j) **China RMA**, MAAR, China and Pakistan – Urumqi FIR interface with Lahore FIR.

**Action should be taken as soon as practicable, even prior to APANPIRG/26 if possible.*

Note: the RMAs in bold were expected to take the lead in organising the scrutiny groups or alternative means to address the issues.

5.24 **Table 3** provides a comparison of Asia/Pacific RVSM risk as a measure against the TLS, either by RMA 'sub-region[1]' (Conclusion 20/4 − *Asia/Pacific Performance Metrics* refers), or by FIRs. There had been significant improvement in the region meeting the TLS overall, but three 'sub-regions' – BOB, Chinese and Japanese airspace recorded marked increases in risk assessment.

	RASMAG17	**RASMAG18**	**RASMAG19**	**RASMAG20**
RMA 'sub-regions'	78%	89%	22%	67%
FIRs	73%	90%	16%	53%

Table 3: Comparison of Sub-Regional and Regional RVSM TLS Achievement

[1] (1) Melbourne, Brisbane, Nauru, Honiara FIRs (AAMA); (2) Port Moresby FIR (AAMA); (3) Indonesian FIRs (AAMA); (4) Sovereign airspaces of China (China RMA); (5) Fukuoka FIR (JASMA); (6) Bay of Bengal FIRs (MAAR); (7) Western Pacific/South China Sea FIRs (MAAR); (8) Pacific Area (PARMO); and (9) North-East Asia Incheon FIR (PARMO).

LHD Reporting

5.25 **Table 4** provides a comparison of the estimated flight hours for airspace analysed by an RMA, divided by the reported LHDs at RASMAG/18 and RASMAG/19, in order to assess reporting.

Airspace	RASMAG 19 LHDs	RASMAG 20 LHDs	RASMAG 20 Flight Hours	RASMAG 19 Reporting Ratio	RASMAG 20 Reporting Ratio
Mongolia	9	18	(NC) 108,773	1:10,876	1:6,042
India/BOB	162	(+38%) 224	(+13%) 2,110,809	1:11,540	1:9,423
WPAC/SCS	133	(+8%) 144	(-5%) 1,511,839	1:11,889	1:10,498
SW Pacific	61	69	(+33%) 795,450	1:9,835	1:11,528
Indonesia	45	39	(NC) 761,390	1:18,570	1:19,522
China	35	(+194%) 103	2,124,690	1:72,512	1:20,628
Japan	48	(-31%) 34	(+7%) 1,276,693	1:22,947	1:37,549
ROK	3	3	492,360	1:164,120	1:164,120
Pyongyang	0	0	(-16%) 5,012	0	0
Total	496	634	(-19%) 9,187,016	1: 22,829	1:14,490
Pacific	16	37	+33% 1,669,658	1:78,130	1:45,125

Table 4: Comparison of Estimated Flight Hours and Reported LHDs (NC = no change)

5.26 There appeared to be several inconsistencies and gaps in the data provided by RMAs to RASMAG/20. AAMA and JASMA both advised they were using a 2012 TSD for Indonesian and Japanese airspace respectively due to validation issues in relation to new data. MAAR advised that they were using a 2014 TSD for Mongolian airspace, but the estimated flight hours had remained the same as 2013. There was an implausible value of 99,984 hours for the Incheon FIR, less than 10% of Japan's figure (in 2014 the figure of 492,360 hours was used).

5.27 From the comparison in **Table 4** (separating the Pacific portion of airspace because it was largely oceanic in nature and not directly comparable), the average LHD occurred approximately every 14,490 flight hours. The number of reported LHDs had substantially increased in the Chinese and Indian FIRs. As approximately 68% and 98% respectively of these LHDs were category E ATC coordination errors, this could be largely attributed to a major improvement in reporting.

5.28 China RMA was congratulated for their efforts in promoting a higher reporting culture, which has revealed a much more accurate picture of the safety problems that need urgent attention.

5.29 An analysis of the rate of LHD reporting in Chinese, Indian, Indonesian, Japanese (with a low reporting ratio of 1: 37,549) and ROK airspace indicated that despite an improvement in reporting, there may be further improvements required to paint a true picture of the risk-bearing incidents (especially within Indian domestic airspace), particularly by implementation of all elements of a 'just culture' environment. The indications included a lack of reporting over an entire continental airspace, very low reporting ratios such as is evident in ROK airspace, and the reporting of LHDs by one RMA that were not reported by another on the same RMA boundary.

Regional Horizontal TLS Compliance

5.30 The following Asia/Pacific En-Route Monitoring Agency (EMAs) reported horizontal risk assessments as follows, which all met the TLS of 5.0 x 10^{-9} (**Table 5**):

Separation Standard	EMA	Estimated Risk
50NM Lateral Risk	BOBASMA	1.07856×10^{-9}
	JASMA	0.751×10^{-9}
	PARMO	1.35×10^{-9}
	SEASMA	0.045×10^{-9}
30NM Lateral Risk	PARMO	0.53×10^{-9}
50NM Longitudinal Risk	BOBASMA	1.59734×10^{-9}
	PARMO	2.32×10^{-9}
	SEASMA	0.034×10^{-9}
30NM Longitudinal Risk	BOBASMA	0.127551×10^{-9}
	JASMA	0.000578×10^{-9}
	PARMO	3.74×10^{-9}

Table 5: Comparison of Horizontal Risk Assessments

5.31 The application of these horizontal standards met the TLS. The risk for 50NM lateral and 50NM longitudinal separation as calculated by SEASMA was notably lower than other implementations, while the risk for 30NM longitudinal separation was noticeably lower than other EMAs as calculated by JASMA. The meeting noted that the AAMA had not provided any assessments and requested that these be made available for the relevant Australian airspace at RASMAG/21.

Non-RVSM Approved Aircraft

5.32 **Table 6** compared the number of non-RVSM airframes reported by each RMA:

Report	AAMA	China RMA	JASMA	MAAR	PARMO
RASMAG/18	98	43	47	118	15
RASMAG/19	90	33	40	130	19
RASMAG/20	8	45	15	203	26

Table 6: Trend of Non-RVSM airframes Observed by Asia/Pacific RMAs

5.33 Overall, the number of non-RVSM aircraft had decreased by 5% in the past year. This indicated that there was still considerable work to do and APANPIRG Conclusion 24/6 (*Repetitive Non-RVSM Approved Aircraft Operating as RVSM Approved Flights* had not yet been effective.

5.34 Of note was the significant reduction in non-RVSM approved airframes detected by the AAMA and JASMA, but this was unfortunately offset by a large increase in non-RVSM approved aircraft identified by MAAR. This was probably because the most prominent States featured in the list of non-RVSM aircraft all came from the MAAR area of responsibility: India, Thailand, Malaysia, Indonesia and the Philippines.

5.35 Given the large disparity in work (in terms of States/FIRs and aircraft monitored, and problems identified) between the MAAR and the other RMAs, special consideration should be made at RASMAG/20 of support mechanisms for MAAR. While it was accepted that the RMAs work together collaboratively, additional support for MAAR was considered by RASMAG. At the next MAWG, the RMAs and EMAs would discuss how to share capabilities to better support those that have a higher workload.

5.36 RASMAG/20 noted that only Bangladesh had a RASMAG-related APANPIRG Deficiency recorded regarding the requirement of Paragraph 3.3.5.1 of Annex 11 (provision of data for monitoring the height-keeping performance of aircraft). RASMAG/20 agreed to propose the deletion of Bangladesh's Deficiency, but proposed new Deficiencies for non-provision of RVSM approvals safety data by India and the Philippines (**Appendix G**).

5.37 Fiji had failed to provide a December Traffic Sample Data (TSD) for 2013. The TSD for 2014 was not provided in time for PARMO's assessment but it was provided during RASMAG/20.

RMA Monitoring Burden

5.38 **Table 7** compares the outstanding monitoring burden reported by each RMA:

Report	AAMA	China RMA	JASMA	MAAR	PARMO
RASMAG/18	102	141	29	189	118
RASMAG/19	79	87	16	200	37
RASMAG/20	113	105	14	169	20

Table 7: Outstanding Monitoring Burden of Asia/Pacific RMAs

3.42 **Table 7** indicates that the monitoring burden for all the RMAs had remained relatively steady, although PARMO significantly reduced its burden for a second year in a row. MAAR carried 40% of all Asia/Pacific's monitoring burden.

Pakistan - China ATC Coordination Errors Update (IP03)

5.39 In RASMAG/18, China RMA reported there were communication issues between China Urumqi ACC and the Lahore ACC (Pakistan), and the increasing number of LHDs due to ATC coordination errors. China RMA had a side meeting with the Pakistan delegation during CNS SG/18 meeting in July 2014. China planned to establish Very Small Aperture Terminal (VSAT) stations near the borders to improve the communication and surveillance capability between China and Pakistan. A China – Pakistan Communication Coordination meeting was held in Beijing in May 2015 to discuss the VSAT station project requirement.

Lack of LHD Reporting Investigation and Measures Taken (IP04)

5.40 Concerns were raised during the RASMAG/19 meeting when a comparison of regional reporting ratios and LHDs reported by neighbouring nations (but not by Chinese ATC units) indicated the lack of a mature reporting culture, leading to a lack of known LHDs within Chinese airspace. Air Traffic Management Bureau (ATMB), Civil Aviation Administration of China (CAAC) and China RMA members made visits to seven Chinese regional ATC units in 2014. LHD workshops were held with representatives of controllers, ATC administrative level, safety departments and technical supporting units. This helped China RMA to understand the current reporting status and to identify any problems ATC might have in reporting LHD events, based on controller views.

5.41 China RMA had not used any specialized software to detect non-NIL LHD events. Thus, successful reporting was highly dependent on the controllers' understanding of LHD and the reporting workflow that transferred the data from controllers to the RMA.

5.42 China RMA used the following strategies to change work practices in operational environments and improve LHD reporting:

a) emphasising to controllers what factors contribute to risk;

b) clarifying that coordination errors should be reported as an LHD (controllers tended to emphasise 'deviations' more);

c) updating LHD training materials;

d) simplifying the LHD reporting template;

e) more communications between ATC units concerning LHD reporting; and

f) conducting safety workshops and seminars.

5.43 On behalf of RASMAG the Chairman congratulated China on the significant efforts undertaken to improve the reporting culture and for the excellent results obtained. He stated that this outcome stood as a good example of how an RMA can take positive steps in support of a State to bring about valuable safety benefits.

Brazilian System of RVSM Compliance Enforcement (WP26)

5.44 WP26 presented information from the recent Tenth Meeting of the Regional Monitoring Agencies Coordination Group (RMACG/10, Bangkok, Thailand, 18-22 May 2015), regarding the Brazilian process of enforcement action for non-compliant RVSM aircraft operations for consideration and discussion by the Asia/Pacific Region. RMACG/10 had been informed that Brazil managed non-complaint Brazilian registered aircraft within Brazilian airspace with a focus on specific monitoring from within their Air Traffic Flow Management (ATFM) unit and a clear enforcement process.

5.45 Brazil requested other States to support their initiative by providing information to Brazil on non-compliant Brazilian aircraft operating in non-Brazilian airspace. The RMACG noted that other States may also consider implementing similar enforcement strategies.

Observed Use of Strategic Lateral Offset Procedure (WP27)

5.46 The United States provided a summary of the observed usage of the Standard Lateral Offset Procedure (SLOP) within the Oakland Oceanic FIR for data link aircraft using ADS-C. SLOP was a recommended practice for 'oceanic' airspace operations. The purpose of SLOP was to reduce the concentration of operations about route centreline, which was characteristic of aircraft with highly accurate navigational systems, such as Global Navigation Satellite Systems (GNSS), thus reducing the risk of collision in both vertical and longitudinal dimensions.

5.47 **Table 8** presented the percentage of flights that were observed to be on centreline, 1 NM right offset, and 2NM right offset SLOP procedures (with at least three consecutive ADS-C positions) during April 2014.

Observed SLOP	**Number of operations**	**Percentage**
Centreline	3,015	72.2%
1NM right of centreline	966	23.1%
2NM right of centreline	193	4.6%
Total	4,174	

Table 8: Observed SLOP usage within Oakland FIR, April 2014

5.48 The analysis showed that the observed SLOP usage was below the optimal recommended behaviour, where crews are encouraged to use all three options equally, including the centreline. The meeting noted that SLOP was not relevant on User Preferred Routes (UPR).

5.49 The Chairman thanked PARMO for the excellent work, noting that it was the intention of the AAMA to facilitate similar work (results would be provided at RASMAG/21 if possible).

Comparison of Aircraft Group ASE in the Asia/Pacific Region (WP28)

5.50 The MAAR presented WP28, which provided a comparison chart of aircraft group Altimetry System Error (ASE) measured by ground-based height monitoring systems from RMAs in the Asia/Pacific region. The data comparison for A320, A330, A340, A346, A380, B737NX, B744, B748, B767, B772, B773, B787, and MD11 groups is illustrated in Figure 16.

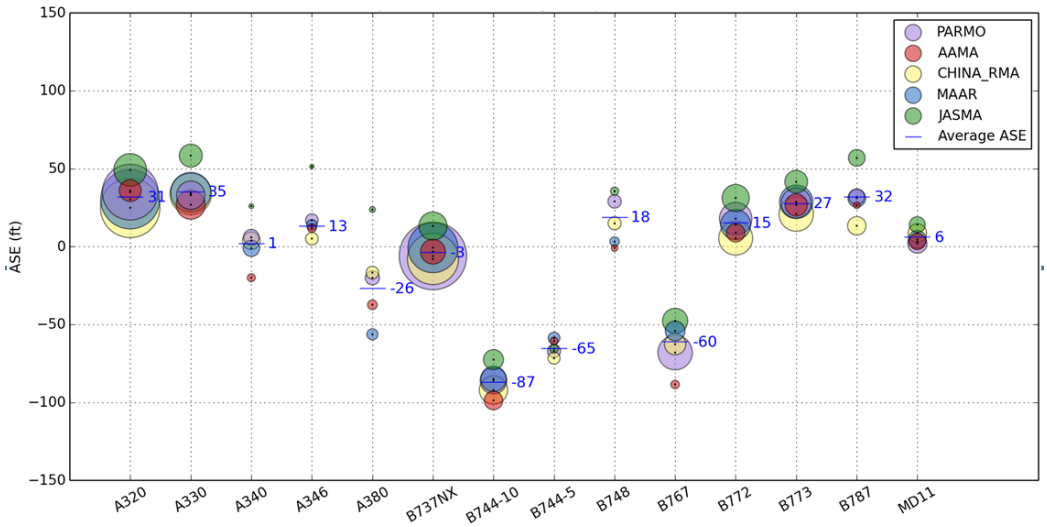

Figure 16: Comparison of Aircraft Group ASE in the Asia/Pacific Region, 2014

5.51 The centre represented the average ASE for each monitoring group observed by each RMA's ground-based monitoring systems, while the circle area represented the number of aircraft monitored by each RMA. An overall average for each aircraft group was calculated and depicted as a blue horizontal line along with the corresponding value.

5.52 The meeting observed from Figure 16 that the average ASE of the B744-10 monitoring group was in excess of 25m (80ft), the limit specified in Minimum Aircraft System Performance Specification (MASPS). The chart also shows that the average ASE values of JASMA were generally higher than those of other RMAs, which was consistent with the results presented in IP07 (Per-airframe ASE comparison between JASMA's HMUs and MAAR's AHMS) from RASMAG/MAWG2.

B787 Aircraft ASE Performance (WP30)

5.53 WP30 provided the results of height-keeping monitoring of B787 aircraft by the AAMA. The results showed that all 26 B787 in the sample had acceptable ASE within a normal distribution, with a mean ASE of 17ft and standard deviation of 27ft.

Asia/Pacific Region PBN Approval Database Proposal (WP29)

5.54 China RMA discussed a proposal for authorization of a responsible RMA to establish and maintain a PBN approval database for Asia/Pacific States without a designated EMA, which have aircraft conducting PBN-related operations. In reviewing the PARMO RNP database, China RMA noted that there were 750 Chinese flights without RNP approval information that had operations in the PARMO's airspace. China RMA stated that the reason for the lack of Chinese PBN approval data is that currently China did not have a designated EMA.

5.55 According to the EMA handbook, an EMA could only be established in airspace where en-route horizontal separations were applied. Without a designated EMA, the PBN approval data of the aircraft conducting PBN operation in other area cannot be collected and shared. At the same time, considering the similarity of aircraft approval information between RVSM and PBN, and the techniques and experience that an RMA has in approval management and data sharing, China RMA suggested authorizing the responsible RMA to establish and maintain a PBN approval database for States that have no designated EMA.

5.56 The meeting discussed the proposal with the Chairman commenting that it may introduce a number of issues particularly if EMAs were left to collect PBN approval data for States for which they were not the assigned agency. He noted that RMAs were already communicating directly with relevant State authorities and that they were in a good position to collect PBN approvals information at the same time as RVSM approvals. Introducing another monitoring agency into the process could be regarded by States as a doubling of work when a single report to one agency was sufficient.

5.57 The Chairman suggested that at the next MAWG meeting, the RMAs and EMAs should openly discuss how to more effectively support one another, including resolving this issue of PBN approval data collection, with the aim to enhance the efficiency of the Asia/Pacific monitoring programs. The RMAs and EMAs present agreed with that proposal. The Chairman agreed to draft a paper for MAWG/3 that outlined the issues to facilitate discussion.

Latest Monitoring Results of Setouchi HMU (IP05)

5.58 Japan presented a summary of the latest height monitoring results obtained from the Setouchi HMU for the period between 16 March 2014 and 15 March 2015. **Figure 17** illustrates the mean ASE trend of each Aircraft Monitoring Group.

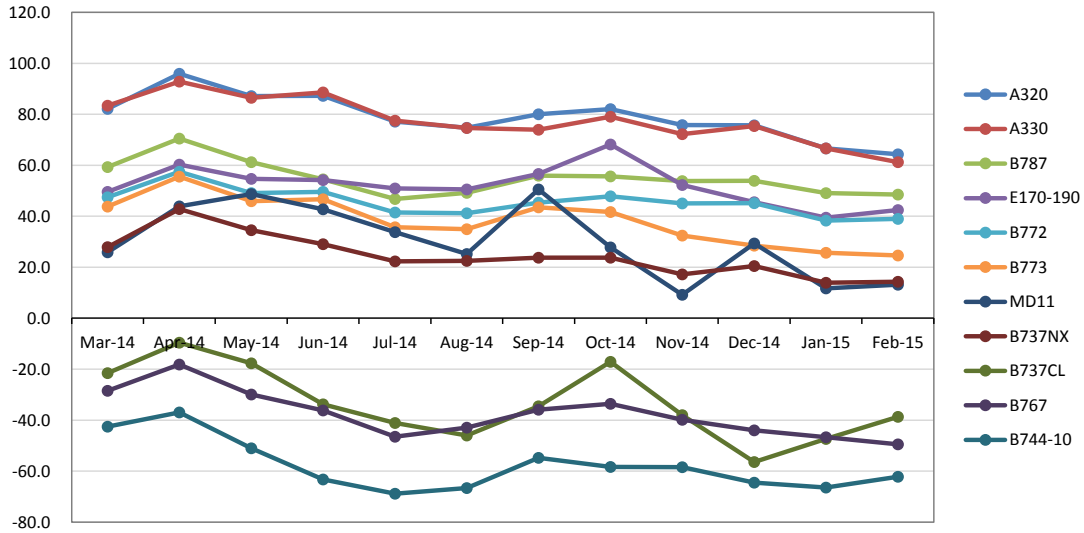

Figure 17: Setouchi HMU Aircraft Monitoring Group ASE Trends

ADS-B Out Data Height Reference for Monitoring (IP07)

5.59 The United States noted that RASMAG, MAWG and RMACG had previously discussed the difficulty in using ADS-B Out data for estimating aircraft height-keeping performance. A determination of the aircraft reference height was possible in some regions, but in some areas it is not possible to determine whether Height Above Ellipsoid (HAE) or Mean Sea Level (MSL) was used as the reference frame.

5.60 One of the key data fields in ADS-B Out messages used to estimate aircraft ASE was the 'Geometric Height Difference from Barometric' subfield. Both the FAA and EUROCONTROL have certification guidance for ADS-B Out installations that guaranteed HAE was used in accordance with guidance in RTCA DO-260A and RTCA DO-260B. The ICAO Aeronautical Surveillance Panel (ASP) Technical Subgroup (TSG) were proposing changes to ICAO Doc 9871 and RTCA DO-260B to facilitate the use of HAE only.

Competent Airspace Safety Monitoring Organizations List Review (WP31)

5.61 ICAO presented the RASMAG *List of Competent Airspace Safety Monitoring Organizations* for review and update (**Appendix H**).

Agenda Item 6: Review and Update RASMAG Task List

RASMAG Task List (WP32)

6.1 The meeting reviewed and updated the RASMAG Task List (**Appendix I** to this report).

Agenda Item 7: Any Other Business

Traffic Flows in WPAC/SCS Airspace (IP06)

7.1 Thailand noted in IP06 that the SEACG/22 established a South China Sea Major Traffic Review Group (SCS-MTFRG), which aimed to review the conflicts and the overall route structure in the SCS airspace in order to optimise airspace capacity and enhance flight safety.

7.2 As an RMA, MAAR had established a mechanism to process and analyse the traffic in the WPAC/SCS region as part of the annual risk estimation. To assist SCS-MTFRG, MAAR, therefore, undertook a task in producing a visual presentation of traffic flows in the WPAC/SCS based on 2014 TSD. Unfortunately, the TSD submitted by States sometimes contained errors, did not follow the template, and may not contain all RVSM traffic in the FIR (this was the reason why MAAR had been encouraging States to submit TSD in the form of flight plans, so that the generation of TSD could be automated).

7.3 IATA commended MAAR for its work in compiling the data for the SCS-MTFRG, suggesting that ADS-B coverage information be included in IP06 Appendix D.

Agenda Item 8: Date and Venue of the Next RASMAG Meeting

8.1 The next RASMAG meeting was tentatively planned to be held in late June 2016 at Bangkok, Thailand.

8.2 The Chairman on behalf of the AAMA offered to host the next MAWG meeting in Canberra, possibly during the first week of December 2015. The RMAs and EMAs accepted the proposal and looked forward to confirmation of dates at the earliest possible time.

Closing of the Meeting

9.1 In closing, the Chairman thanked participants for their contributions to the meeting.

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TENTATIVE LIST OF WORKING AND INFORMATION PAPERS

(Presented by the Secretariat)

The Fourth Meeting of the Future Air Navigation Systems Interoperability Team-Asia (FIT-Asia/4)

WORKING PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
WP01	1	Provisional Agenda	Secretariat
WP02	2	FIT-Asia CRA Arrangements, and Problem and Performance Reporting	Secretariat
WP03	3	Data Link Performance Report for ATS Route L888	China
WP04	3	FANS1A Performance in Chennai FIR	India
WP05	4	Revised Data Link Performance Reporting Template and Guidance	Secretariat
WP06	2	CRA Services for South Asia	IATA
WP07	6	Air Navigation Deficiencies Relating to Data Link Performance Monitoring and analysis	Secretariat
WP08	5	FIT-Asia Task List	Secretariat
WP09	4	Operational Significance of 99.9% Performance Criteria	Secretariat

INFORMATION PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
IP01	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP02	3	Status of Data Link Implementation in India	India

The Twentieth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/20)

WORKING PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
WP01	1	Provisional Agenda	Secretariat
WP02	2	Relevant Meeting Outcomes	Secretariat
WP03	3	AAMA Safety Report	Australia
WP04	3	China Vertical Safety Report	China
WP05	3	JASMA Vertical Safety Report	Japan
WP06	3	MAAR Safety Report	Thailand
WP07	3	PARMO Vertical Safety Report	USA
WP08	3	PARMO Horizontal Safety Report	USA

NUMBER	AGENDA	TITLE	PRESENTED BY
WP09	3	BOBASMA Safety Report	India
WP10	3	JASMA Horizontal Safety Report	Japan
WP11	3	SEASMA Horizontal Safety Report	Singapore
WP12	3	ATS Routes A461 and A583 Horizontal Safety Assessment	Singapore
WP13	4	Development of Global ICAO Manual on PBHSN	Australia/USA
WP14	5	AAMA Assessment of Non-RVSM Approved Aircraft	Australia
WP15	5	China RMA Assessment of Non-RVSM Approved Aircraft	China
WP16	5	JASMA Assessment of Non-RVSM Approved Aircraft	Japan
WP17	5	MAAR Assessment of Non-RVSM Approved Aircraft	Thailand
WP18	5	PARMO Assessment of Non-RVSM Approved Aircraft	USA
WP19	5	AAMA LTHM Burden Estimate Update	Australia
WP20	5	China RMA LTHM Burden Estimate Update	China
WP21	5	JASMA LTHM Burden Estimate Update	Japan
WP22	5	MAAR LTHM Burden Estimate Update	Thailand
WP23	5	PARMO LTHM Burden Estimate Update	USA
WP24	5	Regional Safety Monitoring Assessment	Secretariat
WP25	5	Non-RVSM Aircraft Reporting Templates	Thailand/Australia
WP26	5	Brazilian System of RVSM Compliance Enforcement	Secretariat
WP27	5	Observed Use of Strategic Lateral Offset Procedure	USA
WP28	5	Comparison Of Aircraft Group ASE in the Asia/Pacific Region	USA/Thailand
WP29	5	Asia Pacific Region PBN Approval Database Proposal	China
WP30	5	B787 Aircraft ASE Performance	Australia
WP31	5	Competent Airspace Safety Monitoring Organizations List Review	Secretariat
WP32	6	RASMAG Task List	Secretariat

INFORMATION PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
IP01	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP02	2	RASMAG/MAWG/2 Report	Australia
IP03	5	Pakistan - China ATC Coordination Errors Update	China
IP04	5	Lack of LHD Reporting Investigation and Measures Taken	China
IP05	5	Latest Monitoring Results of Setouchi HMU	Japan
IP06	7	Traffic Flows in WPAC/SCS Airspace	Thailand

NUMBER	AGENDA	TITLE	PRESENTED BY
IP07	5	ADS-B Out Data Height Reference for Monitoring	USA

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Administration	Data Link Implementation Status			ADS-C/ CPDLC Seamless Expectation (Nov 2015)	FIT-Asia CRA Registration	Problem Reports to FIT-Asia CRA	ADS/CDPLC Operational Performance Reported to FIT-Asia/4
	ADS-C	CPDLC	AIDC				
Afghanistan				TBA			
Bangladesh				TBA			
Bhutan				TBA			
Brunei Darussalam				NO			
Cambodia				TBA			
China	X	X		YES	YES		YES
Hong Kong China				TBA			
Macao China				NO			
India	X	X		YES	YES	YES	YES
Indonesia	X	X		YES	YES		
DPR Korea				TBA			
Republic of Korea				TBA			
Lao PDR				TBA			
Malaysia	X	X		YES	YES		
Myanmar	X	X		YES	YES		
Maldives	X	X		YES	YES		
Mongolia				NO			
Nepal				TBA			
Pakistan				TBA			
Philippines				YES	SEASMA*		
Sri Lanka	X	X		YES			
Singapore	X	X		YES	SEASMA*	YES	YES
Thailand				NO			
Viet Nam	X	X		YES	SEASMA*		

* *The South East Asia Safety Monitoring Agency (SEASMA) provides CRA service for Philippines, Singapore and Viet Nam. Philippines has not yet implemented data-link services. Singapore provides performance reports for the Singapore FIR to FIT-Asia. Current SEASMA CRA arrangements expire September 2015.*

Administration	Additional Information
Afghanistan	TBA
Bangladesh	Future implementation
Bhutan	TBA
Brunei Darussalam	
Cambodia	TBA
China	Implemented in 3 FIRs (FIT-Asia/4)
Hong Kong China	TBA
Macao China	
India	Implemented in 4 FIRs (FIT-Asia/4)
Indonesia	Implemented in WAAF FIR. Future implementation Jakarta FIR (FIT Asia/4)
DPR Korea	TBA
Republic of Korea	No Planned Implementation
Lao PDR	TBA
Malaysia	Implemented (FIT-Asia/4)
Myanmar	Implemented (FIT-Asia/4)
Maldives	Implemented (FIT-Asia/4)
Mongolia	Future implementation (FIT-Asia/4)
Nepal	TBA
Pakistan	Planned implementation July/August 2013 (AHACG/3)
Philippines	Future implementation (FIT-Asia/4)
Sri Lanka	Implemented (FIT-Asia/4
Singapore	Implemented (FIT-Asia/4)
Thailand	No planned implementation
Viet Nam	Implemented in Ho Chi Minh FIR. No plan to implement in Ha Noi FIR. (FIT-Asia/4)

* *The South East Asia Safety Monitoring Agency (SEASMA) provides CRA service for Philippines, Singapore and Viet Nam. Philippines has not yet implemented data-link services. Singapore provides performance reports for the Singapore FIR to FIT-Asia. Current SEASMA CRA arrangements expire September 2015.*

International Civil Aviation Organization

The [XX[nd/rd/th] Meeting of the Future Air Navigation Systems Interoperability Team-Asia (FIT-Asia/[XX])

[e.g. Bangkok, Thailand, dd – dd Mmmmm YYYY]

Agenda Item 3: Review of ADS/CPDLC Operations

DATA LINK PERFORMANCE REPORT FOR [STATE/ORGANIZATION]

(Presented by [NAME OF STATE/ORGANIZATION]

SUMMARY

This paper presents data link performance data for [YYYY] for the [XXXX, XXXX, XXXX……FIR/s] for the period [Mmm YYYY to Mmm YYYY]

- FIR 1
- FIR 2
- etc……

1. INTRODUCTION

1.1 TEXT

2. DISCUSSION

[XXXX] FIR CPDLC Actual Communications Performance (ACP)

2.1 [EXECUTIVE SUMMARY]

2.2 **Table 1** and **Figure 1** present overall CPDLC Actual Communications Performance (ACP) for messages sent within the [XXXX] FIR by media type (Satellite, VHF, HF, and the combined total), for the period [Mmm YYYY to Mmm YYYY].

[XXXX]FIR CPDLC ACP				
Messages		**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
Satellite	XX	XX	XX	
VHF	XX	XX	XX	
HF	XX	XX	XX	
Total	XX	XX	XX	

Table 1: [XXXX] FIR CPDLC ACP per Media Type

[INSERT ACP GRAPH]
Figure 1: [XXXX] FIR ACP by Data Link Media Type

[XXXX] FIR CPDLC Actual Communications Technical Performance (ACTP)

2.1 [EXECUTIVE SUMMARY].

2.2 **Table 2** and **Figure 2** present overall CPDLC Actual Communications Technical Performance (ACTP) for messages sent within the [XXXX] FIR by media type (Satellite, VHF and the combined total of both), for the period [Mmm YYYY to Mmm YYYY].

XXXX FIR CPDLC ACTP				
Messages		**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
Satellite	XX	XX	XX	
VHF	XX	XX	XX	
HF	XX	XX	XX	
Total	XX	XX	XX	

Table 2: XX FIR CPDLC ACTP

[INSERT ACTP GRAPH]
Figure 2: [XXXX] FIR ACTP by Data Link Media Type

[XXXX] FIR CPDLC Actual Communications Performance (ACP) per Operator (de-identified)

2.3 [EXECUTIVE SUMMARY]

2.4 **Table 3** and **Figure 3** present CPDLC Actual Communications Performance per Operator (de-identified) for messages sent within the [XXXX] FIR, for the period [Mmm YYYY to Mmm YYYY].

[XXXX] FIR CPDLC ACP per Operator				
Operator (de-identified)	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	
XXX	XX	XX	XX	

Table 3: [XXXX] FIR CPDLC ACP per Operator

[INSERT CPDLC ACP PER OPERATOR GRAPH]
Figure 3: [XXXX] FIR CPLC ACP per Operator

[XXXX] FIR ADS-C Downlink Latency

2.5 [EXECUTIVE SUMMARY]

2.6 **Table 4** and **Figure 4** present ADS-C Downlink Latency for messages sent within the [XXXX] FIR per media type (Satellite, VHF, HF, and the combined total), for the period [Mmm YYYY to Mmm YYYY].

[XXXX] FIR ADS-C Downlink Latency				
Messages		**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
Satellite	XX	XX	XX	
VHF	XX	XX	XX	
HF	XX	XX	XX	
Total	XX	XX	XX	

Table 4: [XXXX] FIR CPDLC ACTP (VHF) per Media Type

[INSERT ADS-C DOWNLINK LATENCY GRAPH]
Figure 4: xx FIR ADS-C Downlink Latency

[HEADING *description as necessary*]

2.7 [TEXT]

[ADD HERE ANY ITEM FROM ATTACHMENT (DISCUSSION, TABLE AND GRAPH) REQUIRING PARTICULAR ATTENTION BY THE MEETING, e.g. significant performance problems, service interruptions, etc.]

[HEADING *e.g* Summary *or other description as necessary*]

2.8 [TEXT]

2.9 Further data link performance analysis is provided in **Attachment A**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to: AMEND AS APPROPRIATE

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate.

…….

ATTACHMENT A – ADDITIONAL ANALYSIS

1. CPDLC ACTUAL COMMUNICATIONS PERFORMANCE (ACP)

[XXXX] FIR CPDLC Actual Communications Performance (ACP) per Month - Satellite

1.1 [EXECUTIVE SUMMARY]

1.2 **Table X** and Figure X present CPDLC ACP per month for messages sent within the [XXXX] FIR by Satellite data link, for the period [Mmm YYYY to Mmm YYYY].

[XXXX] FIR CPDLC ACP per Month - Satellite				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	
XXX	XX	XX	XX	

Table X: XX FIR CPDLC ACP per Month - Satellite

[INSERT ACP PER MONTH – SATELLITE GRAPH]
Figure X: [XXXX] FIR ACP per Month - Satellite

[XXXX] FIR CPDLC Actual Communications Performance (ACP) per Month - VHF

1.3 [EXECUTIVE SUMMARY]

1.4 **Table X** and **Figure X** present CPDLC ACP (VHF) per month for messages sent within the [XXXX] FIR by VHF data link, for the period [Mmm YYYY to Mmm YYYY].

XXXX FIR CPDLC ACP per Month - VHF				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	
XXX	XX	XX	XX	

Table X: XX FIR CPDLC ACP per Month - VHF

[INSERT XXXX ACP PER MONTH – VHF GRAPH]
Figure X: [XXXX] FIR ACP per Month - VHF

[XXXX] FIR CPDLC Actual Communications Performance (ACP) per Month - HF

1.5 [EXECUTIVE SUMMARY].

1.6 **Table X and Figure X present** CPDLC ACP measurements per month for messages sent within the [XXXX] FIR by HF data link, for the period [Mmm YYYY to Mmm YYYY].

XXXX FIR CPDLC ACP per Month - HF				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	-
XXX	XX	XX	XX	

Table X: [XXXX] FIR CPDLC ACP per Month - HF

[INSERT CPDLC ACP (HF) PER MONTH GRAPH]
Figure X: [XXXX] FIR CPDLC ACP per Month – HF

2. CPDLC ACTUAL COMMUNICATIONS TECHNICAL PERFORMANCE (ACTP)

[XXXX] FIR CPDLC Actual Communications Technical Performance (ACTP) per Month – Satellite

2.3 [EXECUTIVE SUMMARY].

2.4 **Table X** and **Figure X** present CPDLC ACTP per month for messages sent within the [XXXX] FIR by Satellite, for the period [Mmm YYYY to Mmm YYYY].

[XXXX] FIR CPDLC ACTP - Satellite				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	
XXX	XX	XX	XX	

Table X: XX FIR CPDLC ACTP per Month - Satellite

[INSERT ACTP PER MONTH – SATELLITE GRAPH]
Figure X: xx FIR ACTP per Month - Satellite

[XXXX] FIR CPDLC Actual Communications Technical Performance (ACTP) per Month - VHF

2.5 [EXECUTIVE SUMMARY]

2.6 **Table X** and **Figure X** present CPDLC ACTP per month for messages sent within the [XXXX] FIR by VHF data link, for the period [Mmm YYYY to Mmm YYYY].

[XXXX] FIR CPDLC ACTP (VHF)				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	
XXX	XX	XX	XX	

Table X: XX FIR CPDLC ACTP (VHF) per Month

[INSERT ACTP (VHF) PER MONTH - VHF GRAPH]
Figure X: [XXXX] FIR CPDLC ACTP (VHF) per Month

[XXXX] FIR CPDLC Actual Communications Technical Performance (ACTP) per Month - HF

2.7 [EXECUTIVE SUMMARY]

2.8 **Table X** and **Figure X** present CPDLC ACTP per month for messages sent within the [XXXX] FIR by HF data link, for the period [Mmm YYYY to Mmm YYYY].

[XXXX] FIR CPDLC ACTP (HF)				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	

XXX	XX	XX	XX	
XXX	XX	XX	XX	

Table X: XX FIR CPDLC ACTP (HF) per Month

[INSERT ACTP (HF) PER MONTH GRAPH]
Figure X: [XXXX] FIR CPDLC ACTP (HF) per Month

3. CPDLC COMMUNICATIONS PERFORMANCE PER OPERATOR

[XXXX] FIR CPDLC Actual Communications Technical Performance (ACTP) per Operator (de-identified)

3.1 [EXECUTIVE SUMMARY]

3.2 **Table X** and **Figure X** present CPDLC Actual Communications Technical Performance per Operator (de-identified) for messages sent within the [XXXX] FIR, for the period [Mmm YYYY to Mmm YYYY]..

[XXXX] FIR CPDLC ACTP per Operator				
Operator (de-identified)	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	-
XXX	XX	XX	XX	

Table X: [XXXX] FIR CPDLC ACTP per Operator

[INSERT CPDLC ACTP PER OPERATOR GRAPH]
Figure X: [XXXX] FIR CPLC ACP per Operator

XXXX FIR CPDLC Pilot Operational Response Time (PORT) per Operator (de-identified)

3.3 [EXECUTIVE SUMMARY]

3.4 **Table X** and **Figure X** present CPDLC Pilot Operational Response Time per Operator for messages sent within the [XXXX] FIR, for the period [Mmm YYYY to Mmm YYYY].

[XXXX] FIR CPDLC PORT per Operator				
Operator (de-identified)	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	-
XXX	XX	XX	XX	

Table X: [XXXX] FIR CPDLC PORT per Operator

[INSERT CPDLC PORT PER OPERATOR GRAPH]
Figure X: [XXXX] FIR CPLC PORT per Operator

4. ADS-C DOWNLINK LATENCY

[XXXX] FIR ADS-C Downlink Latency per Month - Satellite

4.1 [EXECUTIVE SUMMARY]

4.2 **Table X** and **Figure X** present ADS-C Downlink Latency per month for messages sent within the [XXXX] FIR by Satellite data link, for the period [Mmm YYYY to Mmm YYYY].

XXXX FIR ADS-C Downlink Latency - Satellite				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	
XXX	XX	XX	XX	

Table X: XX FIR ADS-C Downlink Latency per Month - Satellite

[INSERT ADS-C DOWNLINK LATENCY PER MONTH – SATELLITE GRAPH]
Figure X: xx FIR ADS-C Downlink Latency (Satellite) per Month

[XXXX] FIR ADS-C Downlink Latency per Month - VHF

4.3 [EXECUTIVE SUMMARY]

4.4 **Table X** AND Figure X present ADS-C Downlink Latency per month for messages sent within the [XXXX] FIR by VHF data link, for the period . **Figure X** presents the ADS-C Downlink Latency (VHF) measurement per month for the period [Mmm YYYY to Mmm YYYY]..

[XXXX] FIR ADS-C Downlink Latency - VHF				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	
XXX	XX	XX	XX	

Table X: XX FIR ADS-C Downlink Latency per Month - VHF

[INSERT ADS-C DOWNLINK LATENCY (VHF) PER MONTH GRAPH]
Figure X: xx FIR ADS-C Downlink Latency (VHF) per Month

XXXX FIR ADS-C Downlink Latency per Month - HF

4.5 **Table X** and **Figure X** present ADS-C Downlink Latency per month for messages sent within the [XXXX] FIR by HF data link, for the period [Mmm YYYY to Mmm YYYY].

[XXXX] FIR ADS-C Downlink Latency per Month - HF				
Month	**Messages**	**% < XXX sec (Target XX%)**	**% < XXX sec (Target XX%)**	**Remarks**
XXX	XX	XX	XX	
XXX	XX	XX	XX	-
XXX	XX	XX	XX	

Table X: [XXXX] FIR ADS-C Downlink Latency per Month - HF

[INSERT CPDLC ACP (HF) PER MONTH GRAPH]
Figure X: [XXXX] FIR ADS-C Downlink Latency per Month - HF

…….

Guidance for the Completion of the Data Link Performance Data Reporting Template

1. Analysis Period

FIT-Asia States should analyze and report datalink performance for the 12-month period from January to December each year.

2. Performance Data

Appendix D of the *Global Operational Data-Link Guidance Document* (GOLD) details performance data and data formats for post-implementation monitoring.

Guidance is provided on:

- how to obtain the required data points from FANS 1/A, ACARS and ATN B1 messages;
- the calculation of:
  - actual communication performance (ACP);
  - Actual communication technical performance;
  - Pilot operational response time (PORT); and
  - Actual surveillance performance.

Examples of the type of analysis that can be carried out at an ANSP level are also included.

GOLD is available through the ICAO Secure Portal, and on the ICAO Asia/Pacific Regional Office website at http://www.icao.int/APAC/Documents/edocs/GOLD_2Edition.pdf.

3. G-PAT

The GOLD Performance Analysis Tool (G-PAT) may be used for the analysis of data collected in accordance with GOLD guidelines. G-PAT, is available on the ICAO GOLD secure website, or may be obtained through direct enquiry by any State or ANSP to the Informal South Pacific ATS Coordinating Group (ISPACG, http://www.ispacg-cra.com)

4. CRA Registration and Problem Reporting

All FIT-Asia Administrations should should register on the FIT-Asia CRA website at http://www.ispacg-cra.com.

All data link problems detected through performance analysis or other sources, such as ATS or aircraft operator reports, should be reported through the FIT-Asia CRA, and subsequently reported to FIT-Asia meetings.

Data Link Service Providers only retain information for 90 days. It is strongly recommended that problem reports are submitted to FIT-Asia CRA within 60 days of occurrence

5. Establishment of an Implementation/Interoperability Team and CRA

Information on the establishment and operation of an implementation/interoperability team and CRA including roles, terms of reference, functions and resource requirements can be found in the *Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia Pacific Region (Version 4.0 – February 2011)*, available on the ICAO Asia/Pacific Regional Office website at:

http://www.icao.int/APAC/Documents/edocs/GuidanceMaterial_EndToEnd_ver4.pdf.

……

FIT-ASIA — TASK LIST

(last updated 25 May 2015)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
1/1	Notice to remind pilots of the importance to check that a logon was completed correctly and to periodically check to ensure the data-link connection was maintained.	FIT/2	United States to forward copy of NOTAM	Closed	
1/2	Provide an average availability outcome for ADS-C in the same manner as the CPDLC analysis.	FIT/2	Japan	Closed	Japan is not a member of FIT-Asia
1/3	Development of a template for the provision of data-link performance data, such as Actual Communications Technical Performance (ACTP), Actual Communications Performance (ACP), Pilot Operational Response Time (PORT) and surveillance latency information	FIT/2	ICAO	Closed	
2/1	Investigate the issue of identifying and validating competent CRAs, and related coverage and jurisdiction issues TO BE AMENDED PER MEETING REPORT	FIT-Asia/3	Secretariat	Closed	
2/2	Draw to the attention of airspace users the importance of reporting data-link problems and the lack of such reports, and ask that attention be paid to improved reporting.	FIT-Asia/3	IATA	Closed	
2/3	Make changes to the ISPACG CRA website to facilitate its use by FIT-Asia.	FIT-Asia/4	New Zealand	Open	FIT-Asia States can register to the website. Final changes to the interface are expected to be completed July 2014. Final changes to the interface are expected to be completed July 2014
2/4	States to inform Regional Office of current data-link service status, and/or provide update on planned implementation	~~FIT-Asia/3~~ Ongoing	FIT-Asia States/Secretariat	Open	Secretariat to send reminder via State Letter (FIT-Asia/3)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
2/5	Draw to the attention of airspace users the safety implications of incorrect downlinking of BACK ON ROUTE message	FIT-Asia/3	IATA	Closed	
2/6	Remind airspace users of the requirements for correct CPDLC logon, the procedures in the event of logon rejection, and the requirement to notify affected ATSUs in the event of any amendment to information in the original flight plan	FIT-Asia/3	IATA	Closed	
3/1	Seek appropriate expert advice on the operational significance of 99.9% performance criteria, and what can be done to meet it in cases of ACP, ACTP and ADS-C Downlink Latency "just" failing to meet the standard	FIT-Asia/4	Secretariat	~~Open~~ Completed	
3/2	Provide feedback to G-PAT technical authority/expert regarding a) data for dates more than 12 months old being combined into month 1 performance data b) lack of a G-PAT tool to de-identify the operator (currently done manually)	~~FIT-Asia/4~~ FIT-Asia/5	Secretariat	Open	Response to be circulated to FIT-Asia States on receipt.
3/3	Editorial review of performance reporting template (including the use of ">" where "<" should be used.	31 July 2014	Secretariat	~~Open~~ Completed	
3/4	Register on FIT-Asia CRA Website	~~31 December 2014~~ Ongoing	ALL FIT-Asia States/Administrations	Open	In accordance with APANPIRG Conclusion 24/24
3/5	Provide and promulgate in AIP the point of contact for airspace users to report ADS-C/CPDLC problems to the State/Air Navigation Service Provider	31 December 2014	ALL FIT-Asia States/Administrations	~~Open~~ Closed	Draft Conclusion FIT-Asia 3/2
4/1	Provide update on SEASMA future provision of CRA service	FIT-Asia/5	Singapore	Open	
4/2	Provide more clarity on how to use the website, by graphic description of the problem reporting process	31 August 2015	Boeing CRA	Open	Consider PowerPoint presentation with audio and video

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
4/3	Provide simple description of FANS automatic handoff process	31 August 2015	Boeing CRA	Open	
4/4	Provide information on which aircraft types are experiencing HF ADS-C Downlink latency problems for analysis by Boeing CRA	30 June 2015	China	Open	CRA to analyse why aircraft are reverting to HF in areas where good SATCOM coverage exists.
4/5	Provide list of Satellite and HF ground-stations for FIT-Asia reference	31 August 2015	Boeing CRA	Open	INMARSAT GES identifiers HF data link ground station identifiers
4/6	Check with ISPACG CRA website administrator regarding: Retrieval of password (Indonesia) Multiple users per State (e.g. 2 x separate FIRs)	12 June 2015	Secretariat	Open	

ATM Deficiencies List

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
Data Link Performance Monitoring and Analysis								
Requirements of Paragraph 2.27.5 of Annex 11 not met.	China	Post-implementation monitoring not implemented	29/5/2015	Problem Reports not provided to CRA		China	TBD	A
	Indonesia	Post-implementation monitoring not implemented	29/5/2015	Problem Reports not provided to CRA. Performance monitoring and analysis not reported to FIT.		Indonesia	TBD	A
	Malaysia	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	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

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
	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	Post-implementation monitoring not implemented	29/5/2015	Not registered with competent CRA. Problem Reports not provided to CRA. Performance monitoring and analysis not reported to FIT.		Sri Lanka	TBD	A
	Viet Nam	Post-implementation monitoring not implemented	29/5/2015	Performance monitoring and analysis not reported to FIT.		Viet Nam	TBD	A

ATM/AIS/SAR Deficiencies List (Updated 30 July 2014)

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
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)~~	~~Bangladesh~~	~~Annex 11 requirement not implemented.~~	~~11/9/09~~	~~RASMAG/20 agreed to delete this deficiency after review of reporting by Bangladesh~~	~~Bangladesh provide the safety-related data as required. Bangladesh advised ATM/AIS/SAR/SG/20 that the data were submitted to MAAR in 2008 and 2009. Thailand to confirm.~~	~~Bangladesh~~		U
Requirement of Paragraph 3.3.5.1 of Annex 11 (provision of data for monitoring the height-keeping performance of aircraft)	India	Annex 11 requirement not implemented.		Established by RASMAG/20- failure to provide RVSM approvals summary data	Lack of	India		U
Requirement of Paragraph 3.3.5.1 of Annex 11 (provision of data for monitoring the height-keeping performance of aircraft)	Philippines	Annex 11 requirement not implemented.		Established by RASMAG/20- failure to provide RVSM approvals summary data		Philippines		U

APANPIRG Asia/Pacific Airspace Safety Monitoring

RASMAG LIST OF COMPETENT AIRSPACE SAFETY MONITORING ORGANIZATIONS

The Regional Airspace Safety Monitoring Advisory Group of APANPIRG (RASMAG) is required by its terms of reference to recommend and facilitate the implementation of airspace safety monitoring and performance assessment services and to review and recommend on the competency and compatibility of airspace monitoring organizations. In order to assist in addressing these requirements, RASMAG updates and distributes the following list of competent airspace safety monitoring organizations for use by States requiring airspace safety monitoring services. In the context of the list, abbreviations have meanings as follows:

- RMA – Regional Monitoring Agency – safety assessment and monitoring in the vertical plane (i.e. RVSM);
- EMA – En-route Monitoring Agency – safety assessment and monitoring in the horizontal plane (i.e. RVSM, RNAV10, RNP4);
- CRA – Central Reporting Agency – technical performance of data link systems (i.e. ADS/CPDLC); and
- FIT – FANS 1/A Interoperability/Implementation Team – parent body to a CRA.

(Last updated 30 August 2012)

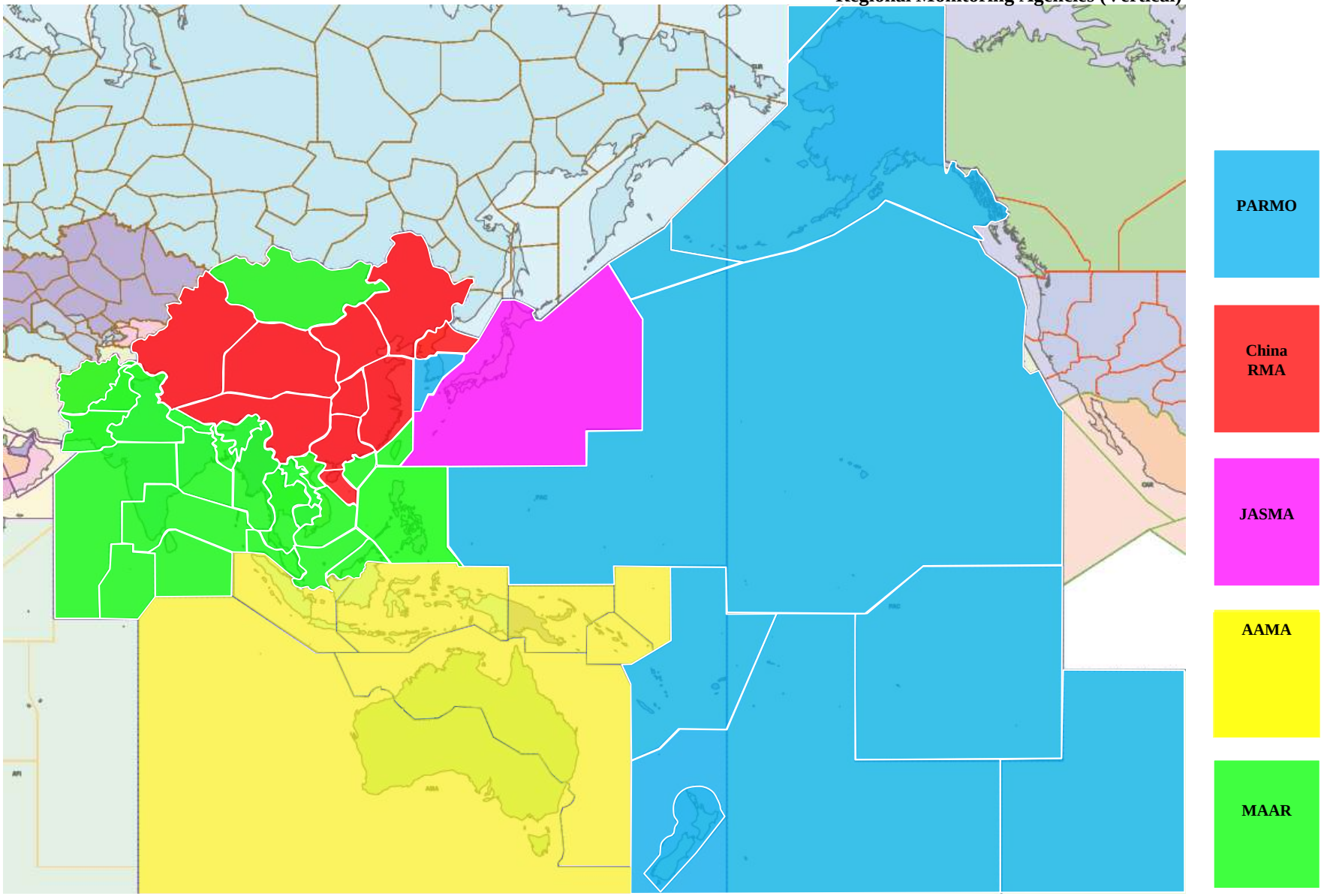
Organisation *(including contact officer)*	**State**	**Competency**	**Status**	**Airspace assessed (FIRs)**
Australian Airspace Monitoring Agency (AAMA) - Airservices http://www.airservicesaustralia.com/organisations/aama/default.asp Mr. Robert Butcher, Systemic Analysis, Monitoring and Review Manager, Safety Improvement Branch Safety, Environment and Assurance Group Airservices Australia email: robert.butcher@airservicesaustralia.com or aama@airservicesaustralia.com	Australia	RMA	Current	Brisbane, Honiara, Jakarta, Melbourne, Nauru, Port Moresby and Ujung Pandang (including Timor-Leste) FIRs
		EMA	Current	Brisbane, Melbourne, Honiara and Nauru FIRs

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
China RMA - **Air Traffic Management Bureau, (ATMB) of Civil Aviation Administration of China (CAAC)** http://www.chinarma.cn Ms. Susan Jun Zhao, Coordinator of China RMA, ADCC, ATMB of CAAC email: rmachina@rmachina.cn ~~Mr. Tang Jinxiang, Manager China RMA ADCC, ATMB, email: tangjx@adcc.com.cn~~	China	RMA	Current	Beijing, Guangzhou, Kunming, Lanzhou, Pyongyang, Sanya, Shanghai, Shenyang, Urumqi, and Wuhan FIRs.
India Bay of Bengal Arabian Sea Indian Ocean Safety Monitoring Agency (BOBASMA) http://www.aai.aero/public_notices/aaisite_test/bobasma_index.jsp Mr. A. P. Udayanarayanan Joint General Manager (ATM) Phone No:+ 91 44 22561253 Fax No: +91 44 22561740 Email: bobasmachennai@gmail.com : bobasma@aai.aero	India	EMA	Current	Chennai, Colombo, Delhi, Dhaka, Kabul, Karachi, Kolkata, Lahore, Male, Mumbai, Yangon,
Japan Airspace Safety Monitoring Agency (JASMA) Mr. Takashi Imuta, Special Assistant to the Director, Flight Procedures and Airspace Program Office, Japan Civil Aviation Bureau, email: imuta-t07j7@mlit.go.jp	Japan	RMA, EMA and CRA	Current	Fukuoka FIR

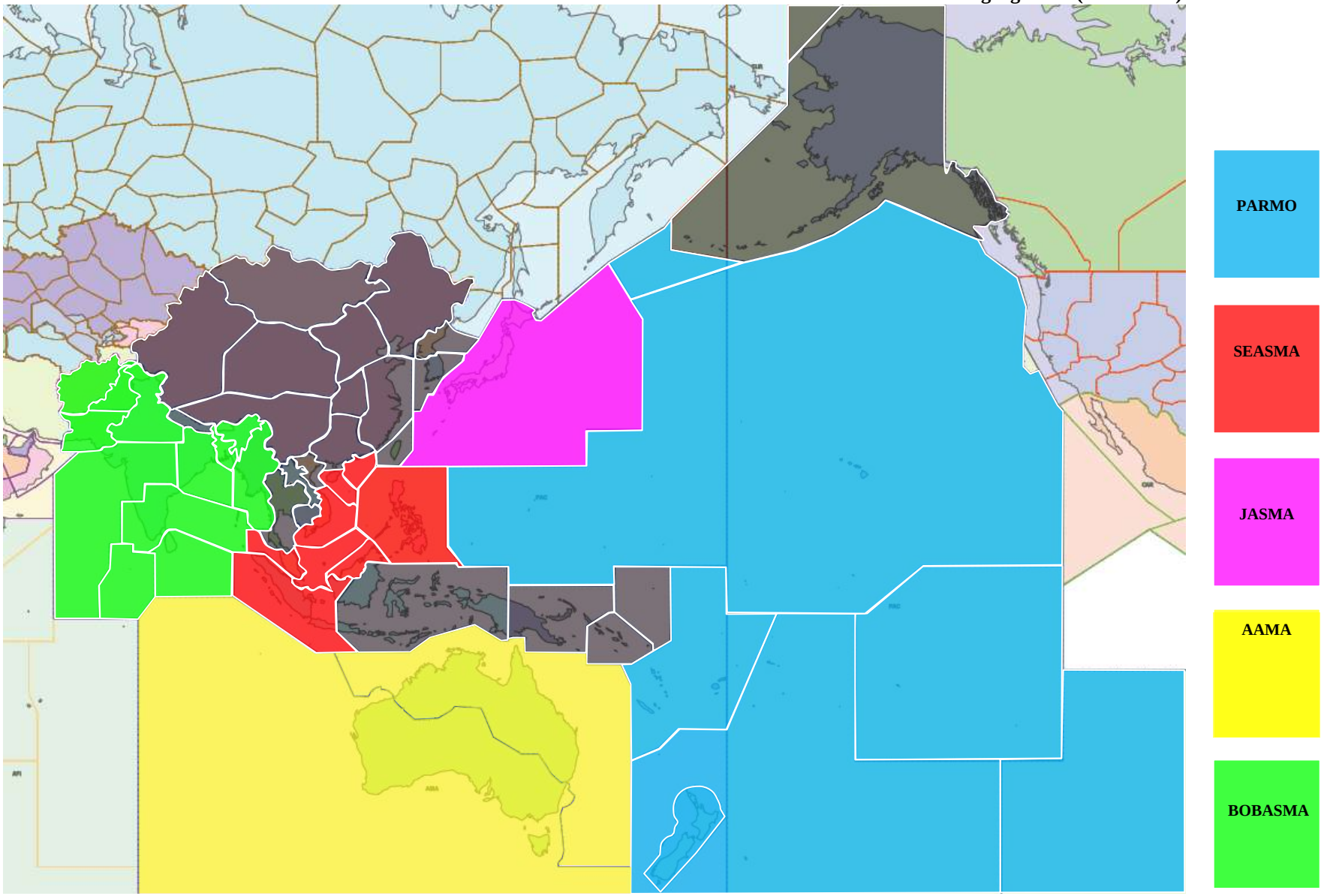
Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
CRA function: Mr. Natsuki IBE, Special Assistant to the Director, Air Navigation Services Planning Division, Civil Aviation Bureau of Japan email: ibe-n24hy@mlit.go.jp web site: http://www.jasma.jp				
Monitoring Agency for the Asia Region (MAAR) **Aeronautical Radio of Thailand LTD** (AEROTHAI) http://www.aerothai.co.th/maar Mr. Chumnan Ruechai Director, Safety Management Department & MAAR AEROTHAI Email: maar@aerothai.co.th	Thailand	RMA	Current	Bangkok, Kolkata, Chennai, Colombo, Delhi, Dhaka, Hanoi, Ho Chi Minh, Hong Kong, Kabul, Karachi, Kathmandu, Kota Kinabalu, Kuala Lumpur, Lahore, Male, Manila, Mumbai, Phnom Penh, Singapore, Taibei, Ulaan Bataar, Vientiane, Yangon FIRs
Pacific Approvals Registry and Monitoring Organization (PARMO) – Federal Aviation Administration (US FAA) http://www.faa.gov/air_traffic/separation_standards/parmo/ Mr. Dale Livingston, Manager, Separation Standards Analysis Team, FAA, email: dale.livingston@faa.gov or aparmo@faa.gov	USA	RMA and EMA	Current	RMA for Anchorage Oceanic, Auckland Oceanic, Incheon, Nadi, Oakland Oceanic, New Zealand, Tahiti FIRs EMA for Anchorage Oceanic, Oakland Oceanic
South East Asia Safety Monitoring Agency (SEASMA) - Civil Aviation Authority of Singapore (CAAS) Mr. Kuah Kong Beng, Director Air Traffic Services, email: KUAH_Kong_Beng@caas.gov.sg	Singapore	EMA and CRA	Current	EMA for Hong Kong, Ho Chi Minh, Kota Kinabalu, Kuala Lumpur, Manila, Jakarta, Sanya and Singapore FIRs CRA for Singapore, Viet Nam and Philippines

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
FIT-ASIA Mr. Bradley Cornell, Boeing Engineering email: Bradley.D.Cornell@Boeing.Com	Boeing USA	FIT	Current	FIRs in the Asian Region not covered by IPACG/FIT and ISPACG/FIT
IPACG/FIT Mr. Natsuki IBE, JCAB Co-Chair, email: ibe-n24hy@mlit.go.jp and To be advised (FAA Co-Chair) email: to be advised	Japan and USA	FIT & CRA	Current	North & Central Pacific (Oceanic airspace within Fukuoka FIR, and Anchorage & Oakland FIRs)
ISPACG/FIT Mr. Bradley Cornell, Boeing Engineering email: Bradley.D.Cornell@Boeing.Com	Boeing USA	FIT & CRA	Current	South Pacific FIRs and members of the Informal South Pacific ATS Coordination Group (ISPACG)

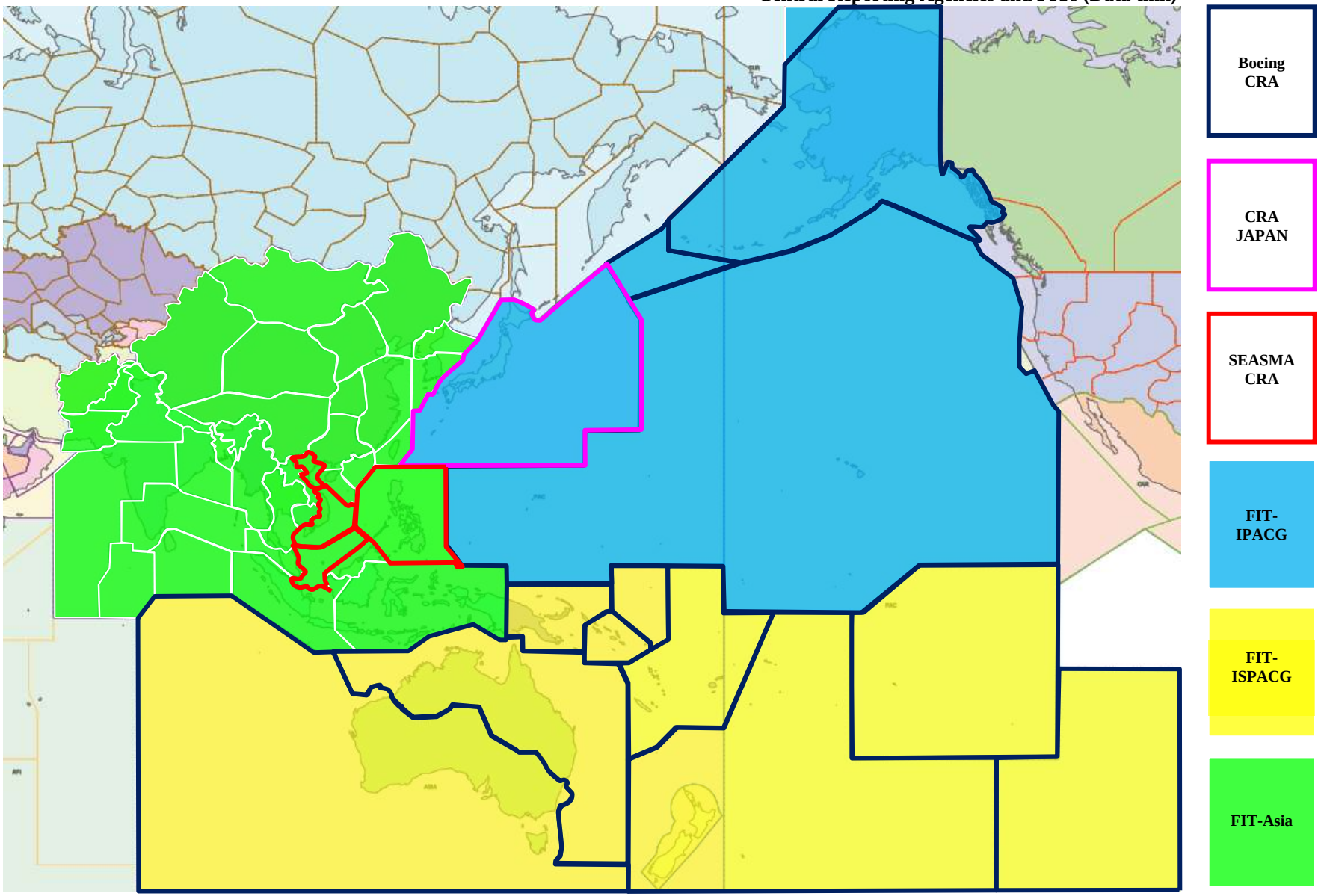
Regional Monitoring Agencies (Vertical)



En-route Monitoring Agencies (Horizontal)



Central Reporting Agencies and FITs (Data-link)



RASMAG — TASK LIST

(last updated 30 May 2015)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
16/7	Assist in the development of generic educational material regarding LHD reporting that could be used in other States	RASMAG/18	All RMAs, initially China RMA, India	Closed	RASMAG/19 WP12 new task 19/3
17/2	Undertake a study to identify shortcomings in the quality of meteorological data	RASMAG/20	Australia (Lead), Thailand, China	Open	
17/3	Re-evaluation of the vertical overlap probability to provide parameters that more accurately represent the characteristics of aircraft types employed in the airspace and reveal the effectiveness of the recently imposed ICAO LTHM requirements.	RASMAG/20 (Progress report to RASMAG/20)	PARMO (Lead), AAMA, JASMA, MAAR	Open	
17/4	An analysis of material and processes required from RMAs to assist airline/ATC education and responses on minimisation of operational errors, including information on hot spots and recommended operational responses.	RASMAG/~~19~~ 20	AAMA and PARMO, IATA, IFALPA	Open	
17/5	Request an amendment to Annex B of Doc 9937 regarding Brunei Darussalam and Vanuatu	RASMAG/20	ICAO	Open	
18/1	Pakistan-China ATS unit communications problem	December 2014	ICAO, Pakistan, China	Open	Follow up at a side meeting at the ATM or CNS Sub-Group
18/2	RO letter to support reporting to MAAR	1 May 2013	MAAR, ICAO	Open	
18/3	RMAs to undertake to identify systemic safety issues and provide feedback to RASMAG on similar analyses of airspace issues.	RASMAG/19	All RMAs	Closed	
19/1	Update RASMAG on the outcome of further investigations of coordination problems between India and Myanmar, which resulted in the receiving controller not acknowledging the same information provided by the transferring controller.	RASMAG/20	MAAR	Open	
19/2	Hot spot between the Ulaanbaatar FIR and the Beijing FIR at positions NIXAL and INTIK, where LHDs had not been reported by Beijing so this	September 2014	China RMA	Open	

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	needed to be investigated.				
19/3	(WP12) Cat E LHD illustration developed by MAAR distribution by RMAs and possibly included in the RMA Manual	RASMAG/20	RASMAG Chair, RMAs	Open	
19/4	(WP13) LLE definition incorporation into the Asia/Pac EMA manual (MAWG to review the EMA Manual prior to update) and the global EMA document that the ICAO Separation and Airspace Safety Panel (SASP) was developing. LHD definition for CAT E incorporation into the global RMA manual	RASMAG/20	RASMAG Chair; MAWG	Open	
19/5	Consider the manner in which a system for listing non-RVSM approved aircraft could be implemented in Asia/Pacific and report to APANPIRG in this respect as a follow-up to APANPIRG Conclusion 24/6	September 2014	RASMAG Chair	Open	
19/6	Special Coordination Meeting (SCM) to be conducted involving Bangladesh, India, Indonesia, Malaysia, and Myanmar to, *inter alia*, investigate the installation of ADS-B, VHF communications and sharing data from a site on Great Nicobar Island and other COM/SUR upgrades to mitigate risk	September 2014	India, Indonesia, Malaysia, and Myanmar, ICAO, possibly IATA and IFATCA	~~Open~~ Closed	
19/7	China to improve its mechanism of LHD reporting and establish an open reporting culture as part of a 'just culture' environment by conducting a review, and requested China to report to APANPIRG of progress made	September 2014	China	Open	
19/8	Investigation of LHDs prevalent in the Kabul FIR. Since the Kabul FIR had military level restrictions, most LHDs involved a neighbouring ACC (Samarkand, Uzbekistan, at position AMDAR) releasing aircraft at flight levels that were not allowed as specified in the Air Traffic Service	September 2014	MAAR, ICAO Regional Office	~~Open~~ Closed	

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	(ATS) Letter of Agreement (LOA).				
20/1	When the new *Manual on Monitoring the Application of Performance-Based Horizontal Separation Minima* (PBHSM) manual was endorsed the Asia/Pacific EMA Manual should have to be deleted from the Asia/Pacific website.	Unknown	ICAO	Open	
20/2	Meeting provided feedback on format and content for amendment of the draft Non-RVSM aircraft reporting templates for use by Asia/Pacific RMAs.		RASMAG Chair	Open	
20/3	At the next MAWG, the RMAs and EMAs would discuss how to share capabilities to better support those that have a higher workload.	December 2015	MAWG	Open	