INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY SIXTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/26)

Bangkok, Thailand, 7 – 10 September 2015

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

3.3: RASMAG

RASMAG OUTCOMES

(Presented by the Secretariat)

SUMMARY

The Working Paper presents information and outcomes from the Fourth Meeting of the Future Air Navigation Systems Interoperability Team-Asia (FIT-Asia/4, 25 May 2015, Bangkok, Thailand) and the Twentieth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/20, 26-28 May 2015, Bangkok).

Strategic Objectives:

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

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

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

1. INTRODUCTION

1.1 The 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.

1.2 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 the Secretariat.

2. DISCUSSION

<u>CRA Services</u>

2.1 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, the FIT-Asia/4 noted that overall there had been little reporting of both problems and performance data.

2.2 The meeting was reminded that the FIT-Asia Terms of Reference (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. Moreover, FIT-Asia/4 recalled that monitoring, reporting and analysis of data-link performance and problems were essential for the achievement and maintenance of system performance required for the application of RNP based separation standards.

2.3 FIT-Asia/4 was reminded that *Conclusion 24/24: ADS/C and CPDLC Problem Reporting and Analysis* requested FIT-Asia States 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 and report problems relating to Automatic Dependent Surveillance-Contract (ADS-C) and Controller Pilot Data-Link Communications (CPDLC) services to the CRA for analysis.

2.4 **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.

2.5 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 (PRs) could not be assessed, as the data link service provider only retained logs for 90 days. In addition, only three administrations had submitted performance data analysis to FIT-Asia/4 (see paragraph 2.10 on Air Navigation Service Deficiencies).

<u>Revised Data Link Performance Reporting Template and Guidance</u>

2.6 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 FIT-Asia/4 considered an updated template and guidance, which mainly consisted of error removal, and restructuring of content and format.

2.7 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 Conclusion.

2.8 The following Draft Conclusion was endorsed by RASMAG/20, for consideration by APANPIRG/26:

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

That, the revised Data Link Performance Reporting Template and Guidance at **APANPIRG/26/WP08/Appendix A** replaces the Data Link Performance Reporting Template on the ICAO Asia/Pacific Regional Office website.

<u>Operational Significance of 99.9% Performance Criteria</u>

2.9 FIT-Asia TF/4 discussed the operational significance of the 99.9% data link performance criteria, and what could be done in cases of ACP, Actual Communication Technical Performance (ACTP) and ADS-C downlink latency 'just' failing to meet the standard. GOLD Appendix D paragraph D 2.4.7.5 was reviewed. To 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, a Draft Conclusion was developed. 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 (the aggregate fleet of all data link aircraft operating in the airspace concerned, except only where it related to analysis of individual operator 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.

<u>Air Navigation Service Deficiencies</u>

2.10 Regarding the lack of response to *Conclusion 24/24: ADS/C and CPDLC Problem Reporting and Analysis*, 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.

2.11 The FIT-Asia/4 and RASMAG/20 meetings agreed to the additions to the APANPIRG Deficiency List at:

- **Appendix B** in respect of Data Link Performance Monitoring and Analysis, , which detailed new deficiencies for China, Indonesia, Malaysia, Myanmar, Maldives, Sri Lanka and Viet Nam;
- **Appendix C**, which detailed new deficiencies for India and the Philippines (see also paragraph 2.42), and the removal of the Bangladesh deficiency in respect of Data Link Performance Monitoring and Analysis and provision of data for monitoring the height-keeping performance of aircraft respectively. These proposed amendments were consolidated and combined with the ATM/SG's ATM/AIS/SAR Deficiency List for ease of reference.

AAMA Safety Report

2.12 The Australian Airspace Monitoring Agency (AAMA) presented the results of Reduced Vertical Separation Minimum (RVSM) safety assessments undertaken by the Australian Airspace Monitoring Agency (AAMA) for the twelve month period ending 31 December 2014. 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 **3.01×10^{-9}** (TLS, 5.0×10^{-9}).

2.13 Regarding Indonesian airspace, the TLS was met for the reporting period (**2.18×10^{-9}**). 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.

China RMA Safety Report

2.14 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 5.0×10^{-9} fatal accidents per flight hour, with an overall risk estimate of **5.50×10^{-9}**. **Figure 1** presents collision risk estimate trends for the Chinese FIRs.

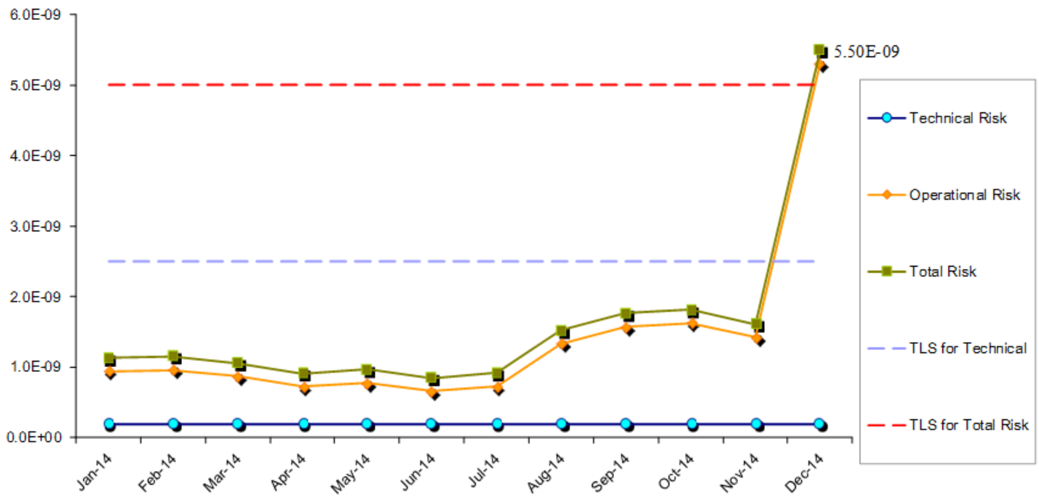

Figure 1: Chinese FIRs RVSM Risk Estimate Trends

2.15 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.

2.16 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.

2.17 The estimate by China RMA of the overall vertical collision risk for the Pyongyang FIR was $\mathbf{1.58 \times 10^{-9}}$ 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.

2.18 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. 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.

<u>JASMA Vertical Safety Report</u>

2.19 Japan Airspace Safety Monitoring Agency (JASMA) presented the results of the airspace safety assessment of the Fukuoka FIR by the JASMA. The report showed that the Fukuoka FIR did <u>not</u> meet the TLS, with the assessed risk calculated as $\mathbf{7.17 \times 10^{-9}}$. **Figure 2** presents collision risk estimate trends during 2014.

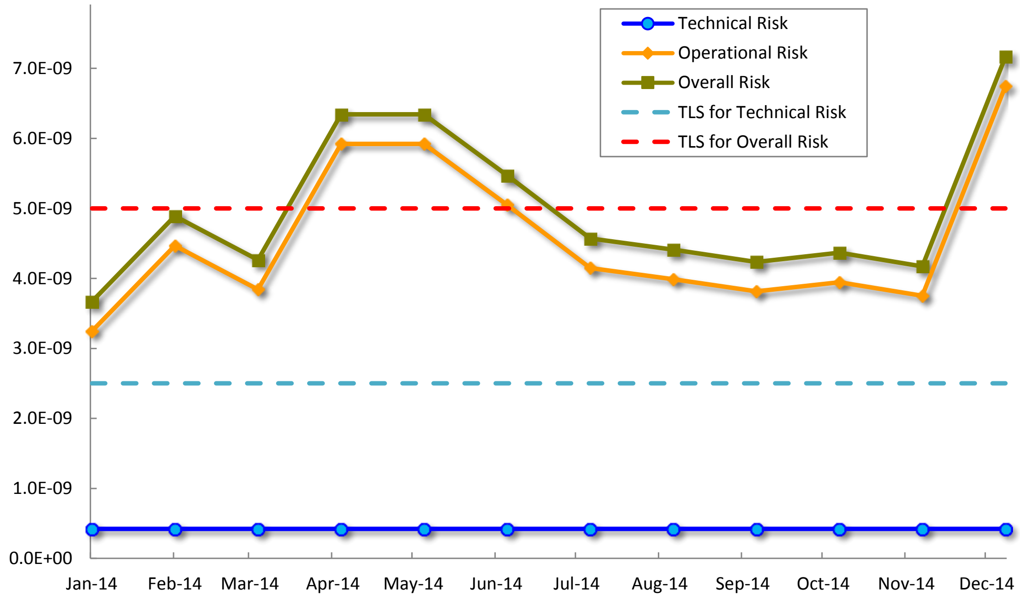

Figure 2: Fukuoka FIR RVSM Risk Estimate Trends

2.20 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

2.21 The Monitoring Agency for the Asian Region (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.

2.22 The BOB RVSM airspace overall risk was estimated to be **18.73×10^{-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. **Figure 3** presents collision risk estimate trends during 2014.

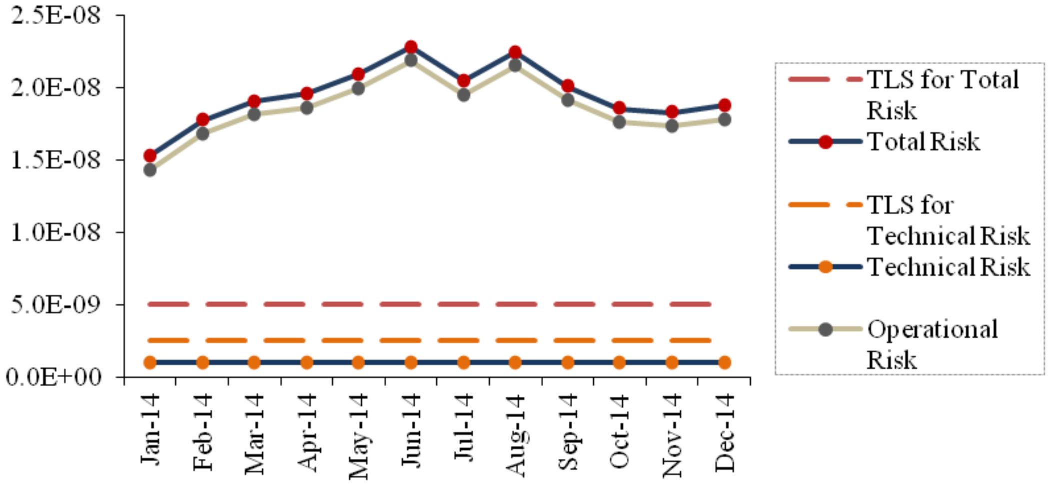

Figure 3: BOB Airspace RVSM Risk Estimate Trends

2.23 In relation to some of the other hotspots identified in the report, the RASMAG Chairman referred to GADER and sought information of what had changed to reduce the numbers of LHDs so significantly. ICAO 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 an ADS-B data sharing agreement had been signed with Myanmar which should help reduce LHDs.

2.24 The WPAC/SCS RVSM airspace total risk was estimated to be **4.14×10^{-9}**, which met the TLS. The meeting recognised that this was an improvement in safety performance since 2013.

2.25 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.

2.26 Even though the overall risk was below the TLS, the meeting recognised that the Philippines, Hong Kong, and Malaysia should still prioritize AIDC implementations between Hong Kong – Manila FIRs and Kota Kinabalu – Manila FIRs.

2.27 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.

<u>PARMO Vertical Safety Report</u>

2.28 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.

2.29 The Incheon FIR RVSM total risk was estimated to be **4.13 x 10^{-9}**, which met the TLS.

<u>Regional Safety Monitoring Assessment</u>

2.30 ICAO presented an overview of safety assessment results from a regional perspective. **Figure 5** indicated the status as reported to RASMAG/20.

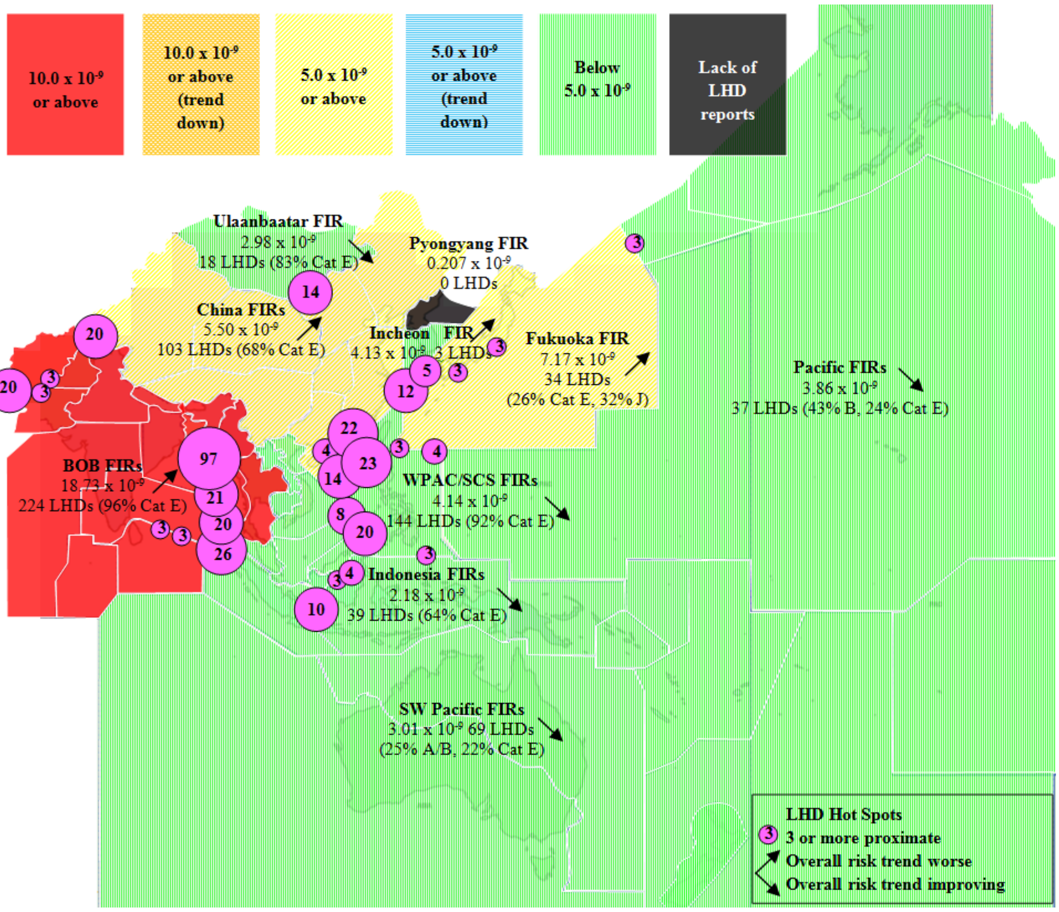

Figure 4: Asia/Pacific TLS compliance reported to RASMAG/20

2.31 **Figure 4** 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 between China and Pakistan 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). .

2.32 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 for consideration by APANPIRG/26:

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.

2.33 **Table 2** 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 2: Comparison of Sub-Regional and Regional RVSM TLS Achievement

<u>LHD Reporting</u>

2.34 **Table 3** 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 3: Comparison of Estimated Flight Hours and Reported LHDs (NC = no change)

2.35 From the comparison in **Table 3** (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.

2.36 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.

2.37 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.

[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).

Regional Horizontal TLS Compliance

2.38 The following Asia/Pacific En-Route Monitoring Agency (EMAs) reported horizontal risk assessments as follows based on Large Longitudinal Errors (LLE) and Large Lateral Deviations (LLD), which all met the TLS of 5.0 x 10^{-9} (**Table 4**):

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

Table 4: Comparison of Horizontal Risk Assessments

Non-RVSM Approved Aircraft

2.39 **Table 5** 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 5: Trend of Non-RVSM airframes Observed by Asia/Pacific RMAs

2.40 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.

2.41 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.

2.42 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 C**).

Brazilian System of RVSM Compliance Enforcement

2.43 The Tenth Meeting of the Regional Monitoring Agencies Coordination Group (RMACG/10, Bangkok, Thailand, 18-22 May 2015), noted the Brazilian enforcement process for non-compliant RVSM aircraft operations. Brazil managed non-complaint Brazilian registered aircraft within their airspace with specific monitoring from within their Air Traffic Flow Management (ATFM) unit and a clear enforcement process. Brazil requested other States to support their initiative by providing information on non-compliant Brazilian aircraft operating in other airspace. RASMAG noted that Asia/Pacific States may also consider implementing similar enforcement strategies.

RMA Monitoring Burden

2.44 **Table 6** 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 6: Outstanding Monitoring Burden of Asia/Pacific RMAs

2.45 **Table 6** indicated 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.

2.46 **Figure 5** 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. MAAR carried 40% of all Asia/Pacific's monitoring burden.

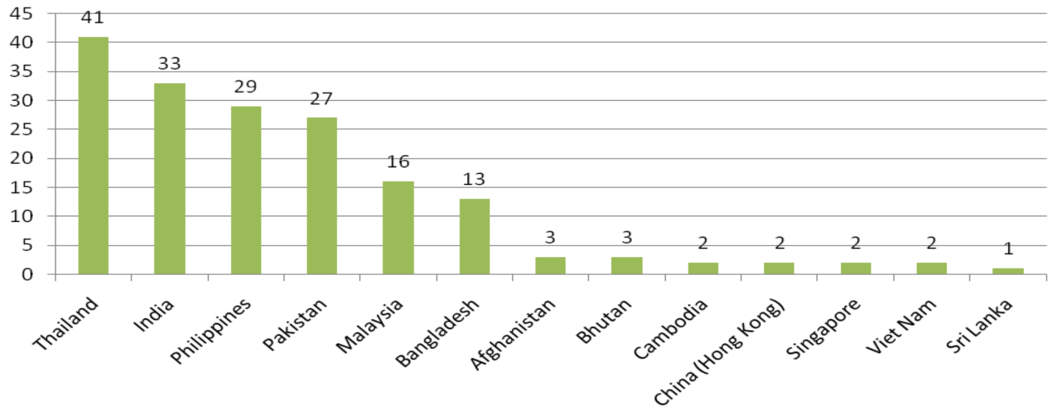

Figure 5: Remaining Monitoring Burden

Comparison of Aircraft Group ASE in the Asia/Pacific Region

2.47 The MAAR presented a comparison of aircraft group Altimetry System Error (ASE) measured by ground-based height monitoring systems from RMAs in the Asia/Pacific Region (**Figure 6**). The meeting observed 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).

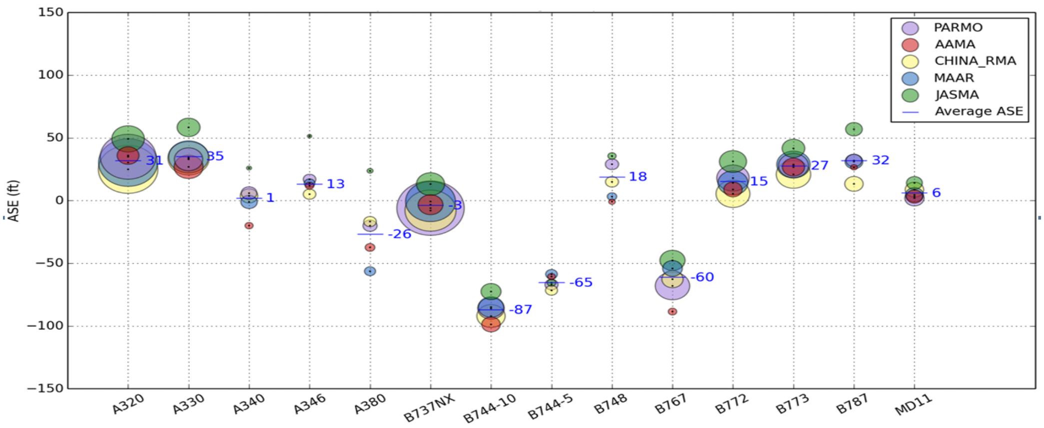

Figure 6: Comparison of Aircraft Group ASE in the Asia/Pacific Region, 2014

Observed Use of Strategic Lateral Offset Procedure

2.48 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. The purpose of SLOP was to reduce the concentration of operations about 'oceanic' route centrelines, which was characteristic of aircraft with highly accurate navigational systems, such as Global Navigation Satellite Systems (GNSS), thus reducing the risk of collision. **Table 7** 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 7: Observed SLOP usage within Oakland FIR, April 2014

2.49 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).

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) discuss paragraph 2.8 (Draft Conclusion RASMAG/20-1: Data Link Performance Reporting Template and Guidance);

c) discuss paragraph 2.9 Draft Conclusion RASMAG/20-2: Data Link Performance Guidelines;

d) discuss paragraph 2.10 Draft Conclusion RASMAG/20-3: ANS Deficiencies Relating to Data Link Performance Monitoring and Analysis;

e) discuss paragraph 2.32 Draft Conclusion RASMAG/20-4: Asia/Pacific LHD Hot Spot Action Plans; and

f) discuss the proposed amendments to the APANPIRG [ATM/AIS/SAR] Deficiency List (paragraphs 2.11 and 2.42);

g) discuss any relevant matters as appropriate.

— — — — — — —

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

<u>[XXXX] FIR CPDLC Actual Communications Performance (ACP)</u>

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.

…………………………

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