International Civil Aviation Organization

The Eleventh Meeting of the FANS Implementation Team for South-East Asia (FIT-SEA/11) and the Eighteenth Meeting of the South-East Asia ATM Coordination Group (SEACG/18)

Bangkok, Thailand, 3 – 6 May 2011

Agenda Item 3: Review Outcomes of Related Meetings

OUTCOMES OF RASMAG/13 and 14

(Presented by the Secretariat)

SUMMARY

This paper presents outcomes of the 13th and 14th meetings of the Regional Airspace Safety Monitoring Advisory Group (RASAMG/13 and 14, August 2010 and February 2011, respectively), for the meeting's review.

This paper relates to –

Strategic Objectives:

- *A:* ***Safety*** *– Enhance global civil aviation safety*
- *C:* ***Environmental Protection and Sustainable Development of Air Transport*** *– Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiatives:

GPI-2 Reduced vertical separation minima
GPI-5 RNAV and RNP (Performance-based navigation)
GPI-16 Decision support systems and alerting systems
GPI-17 Data link applications
GPI-21 Navigation systems
GPI-22 Communication infrastructure

1. INTRODUCTION

1.1 RASMAG/13 was held at the Regional Office, Bangkok, Thailand in August 2010 and RASMAG/14 was held in February 2011. The outcomes of RASMAG/13 and 14 are recorded in the report as follows:

2. DISCUSSION

RASMAG/13

Monitoring of RVSM Non-Approved Aircraft Operating in the RVSM Airspace of Asia Region

2.1 The Monitoring Agency for Asia Region (MAAR) recommended that the following remedial actions be taken:

- States provide approvals records to respective regional monitoring agency (RMA);
- Annual update of RVSM approvals be provided to MAAR; and
- Aircraft registration field be provided as part of the Traffic Sample Data (TSD).

ADS-C/CPCLC Data Link Performance Monitoring

2.2 The United States noted that a lot of monitoring of this type of data link data already took place in the North Atlantic (NAT) and through the FANS Interoperability Teams (FITs) in the Pacific. As a result, the En-route Monitoring Agencies (EMAs) will need to become more active in undertaking this type of monitoring particularly where separation standards require specific communications requirements are met. New Zealand commented that this type of analysis was essential in being able to pinpoint issues with operators, aircraft types or even specific airframes, and therefore allowing follow-up to resolution. New Zealand also noted some concerns with regards to future availability and needs for satellite communication systems, and the level of protection being provided to band width available to aviation industry. The meeting agreed these issues would need to be monitored by RASMAG.

RASMAG/14

Reports from Asia/Pacific RMAs and EMAs

2.3 The Large Height Deviation (LHD) occurrences in the Western Pacific/South China Sea (WPAC/SCS) RVSM airspace are summarized as follows:

- Compared with the previous report, the total LHD duration increased from 98 minutes to 176 minutes while the number of LHD occurrences increased from 74 to 116 occurrences;
- There were two main factors constituting a significant portion of the LHD occurrence in the WPAC/SCS airspace;
  - A LHD event in July 2010 with a duration of 28 minutes caused by equipment failure (Category M: Other); and
  - A significant number of Category E LHD occurrences (a total of 100 occurrences accounted for 129 minutes in duration).
- Furthermore, according to the Category E LHD occurrences:

- The number of LHD occurrences and duration increased significantly from March to September 2010, but started to decline in October and also continue in November 2010; and

- The most common locations (Top 5) where such events occurred in term of duration included ARESI, GORAI, LAXOR, SADAN and PEDNO.

2.4 **Table 1** below summarizes the results of the airspace safety oversight, as of November 2010, in terms of the technical, operational, and total risks for the RVSM operation in the WPAC/SCS airspace.

South China Sea RVSM Airspace – estimated annual flying hours = 905,147 hours (note: estimated hours based on December 2009 traffic sample data)			
Source of Risk	**Lower Bound Risk Estimation**	**TLS**	**Remarks**
Technical Risk	0.64×10^{-9}	2.5×10^{-9}	Below Technical TLS
Operational Risk	5.07×10^{-9}	-	-
Total Risk	**5.71×10^{-9}**	**5.0×10^{-9}**	**Above Overall TLS**

Table 1: Risk Estimates for the RVSM Implementation in WPAC/SCS Airspace

2.5 It was strongly encouraged that States concerned take any remedial and preventive actions necessary to persistently maintain the number of LHD occurrence as well as duration to a minimum. The Chairman asked if a scrutiny group would need to be established to resolve the high number of Category E LHDs now being reported and which are adversely affecting the risk. MAAR responded that at the time of the reporting of these LHDs, the area control centre (ACC) supervisors had discussed the incidents and identified the causes. The Chair commented that while that is commendable, it is after the fact, and that in his view work should be undertaken to proactively resolve these issues systemically. MAAR agreed and noted the previously established scrutiny group had identified the need for automated processes. The Secretary asked whether there was any additional assistance that the Region could provide to assist the early implementation of AIDC, however, no assistance was deemed necessary at this time. The meeting encouraged the States affected by these types of errors to work to resolve these issues as soon as possible through use of available technologies.

2.6 The meeting recognised that Manila was often the receiving centre for some of the errors occurring and that other States involved must recognise this and work to resolve the issues. In discussing this further, the meeting was concerned that the issues should be resolved quickly by the States concerned and proposed that possibly MAAR could coordinate a meeting of those States. MAAR stated they would need time to consider this and would appreciate assistance from the Regional Office in this regard. Further discussion on this issue by the meeting resulted in a proposal by the Philippines that possibly a SEACG working group discussion to resolve Category E errors may be appropriate. Singapore agreed that the right operational people will be in place to undertake that work in a side meeting. The Secretary agreed to ensure that such a meeting was convened at SEACG/18 in May 2011. The Chairman stated that he would inform Indonesia of this outcome at a forthcoming meeting between Australia Airspace Monitoring Agency (AAMA) and the Directorate General of Civil Aviation (DGCA) of Indonesia.

Airspace Safety Monitoring Documentation and Regional Guidance Material

Update Estimate of RVSM Long Term Height Monitoring Burden for the Australia Airspace Monitoring Agency

2.7 A review of the most recent RVSM approvals databases determined that the monitoring burden continues to vary, specifically in the case of Australian and Indonesian operators. The former has seen a decrease of 18 in the total number of airframes required to be monitored to a total of 124. The latter increased by 11 to a total of 72. Overall, the revised monitoring burden for AAMA was expected to be approximately 200 airframes over the two year period commencing November 2010. While the AAMA has responsibility for airspace of both the Solomon Islands and Nauru, aircraft utilised by operators within the States are Australian registered aircraft and therefore included in the count for the State.

2.8 The meeting reviewed the information of the monitoring burden and used the information to update the current monitoring burden anticipated for the Asia/Pacific Regional Monitoring Agencies (RMAs). The Secretariat undertook to update the Long-Term Height Monitoring (LTHM) statement.

2.9 The meeting also discussed the extent to which application of the LTHM monitoring requirement can best be standardised in an operational sense. The Pacific Aircraft Registry and Monitoring Organisation (PARMO) commented that their intention was to use the most recent date of monitoring projected two years forward, noting it would be more focussed on US registered aircraft, but would possibly follow up with States if monitoring is falling behind. After some further discussion it was agreed that the best means for scheduling monitoring is to set November 2010 as the baseline, and anything monitored prior to 2008 will need to be monitored now and then stagger the remainder according to their last successful monitoring after November 2008.

Airspace Safety Monitoring Activities/Requirements in the Asia/Pacific Region

RASMAG List of Competent Airspace Safety Monitoring Organizations

2.10 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 monitoring organizations. Accordingly, the meeting reviewed and updated the 'RASMAG List of Competent Airspace Safety Monitoring Organizations' shown at **Attachment** to this paper for use by States requiring airspace safety monitoring services.

Update of HMU Implementation in Japan

2.11 Japan informed the meeting that 'Setouchi' Height Monitoring Unit (HMU) had been already installed. The flight validation by the flight inspection team of Japan Civil Aviation Bureau (JCAB) would start in February 2011. JCAB will start a trial operation of height monitoring in April 2011. The purpose of the trial will be to collect enough samples of actual height keeping performance data and validate the accuracy of the readings. It was expected that a trial of at least five months will be needed. The official start of operations was planned in September 2011.

Data Link Performance Monitoring Results

2.12 The meeting was informed that Informal South Pacific ATS Coordination Group (ISPACG) CRA had for some time published a collection of data link monitoring data on its website at http://www.ispacg-cra.com/performance.asp. De-identified information is presented by aircraft

type and by operator, and provides a useful overview of data link performance in the South Pacific. The data refers to the Auckland Oceanic FIR and is presented on a monthly basis.

2.13 Continuity is the required probability that an operational communication transaction can be completed within the communication transaction time, either expiration time (ET) or nominal time (TT 95%), given that the service was available at the start of the transaction. The 95% figure in each case represents the TT within which 95% of all transactions must be completed; the 99.9% figure is the ET, which is the maximum time for the completion of the operational communication transaction after which the initiator is required to revert to an alternative procedure.

2.14 The continuity for surveillance Types 400 and 180 easily met the target for surveillance nominal delivery time (DT) 95%, but did not achieve the target for surveillance overdue delivery time (OT). The data available did not enable the outages and service delays to be attributed to specific elements of the data link path, i.e. ANSP, communication service provider, VHF/HF/satellite, aircraft system.

2.15 The meeting noted that while the safety targets for network availability were being achieved at present, it was clear that considerable improvement was necessary if the efficiency target is to be met. The efficiency target supports operational efficiency and orderly flow of air traffic. The nominal times for ADS-C and CPDLC continuity were being achieved, but some improvement is necessary to reach the target for expiration time.

2.16 The meeting discussed whether States understood that this type of performance monitoring was an on-going post-implementation requirement. The United States indicated that Appendix D of the GOLD was based on post-implementation monitoring and corrective action. They noted that the Federal Aviation Administration (FAA) was doing some work to automate the charting of GOLD formatted data and would share that with States on request. Further discussion indicated that there was a need to take some action to encourage air navigation service providers (ANSPs) to provide data link performance data to the central reporting agencies (CRAs). The Secretary advised that he had personally discussed such issues with those States that had not been providing data in an attempt to educate them to the requirements. New Zealand suggested that possibly the FANS Implementation/Interoperability Teams (FITs) should be asked to undertake such an education program. The meeting agreed to this suggestion and indicated that this may also occur at the SEACG meetings. The Secretary was tasked with conveying RASMAG's concern to relevant coordination groups and FITs.

ADS-C/CPDLC Data Link Performance Monitoring

2.17 New Zealand advised the meeting while the *Guidance Material for End-To-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region* includes information on the performance data that ANSPs are expected to provide to the CRAs, to date the CRAs have received very little such data. Consequently, little is known of data link performance in much of the Region, with the inevitable corollary that poor performance may not be detected or corrected.

2.18 It is therefore most important that all ANSPs, whether state agencies or independent organisations, collect the required data link performance data and pass it to the appropriate CRA for analysis, investigation and initiation of any required corrective action. The secretariat agreed with New Zealand's observation and informed the meeting that there had been no data provided from States to FIT for the Bay of Bengal (FIT-BOB). This lack of data hinders FIT-BOB from examining the data link system performance data to allow for the reduced longitudinal separation to 50 NM, thus pending the implementation. In the South China Sea area, data are adequately provided to FIT for Southeast Asia (FIT-SEA).

2.19 The meeting discussed the information presented and recommended appropriate action to encourage ANSPs to provide data link performance data to the CRAs. Accordingly, the meeting proposed a recommendation.

Clarification of Reporting Requirements by ANSPs for Category D and M Operational Errors

2.20 As an additional source of information for States, it was proposed that specific examples of incidents/reports for each LHD taxonomy category are provided. **Table 2** below provides suggested wording and examples for some of the categories for consideration.

Code	LHD Cause
	Operational Errors
A	Flight crew failing to climb/descend the aircraft as cleared
	Example: *Aircraft A was at F300 and assigned F360. A CLAM alert was seen as the aircraft passed F364. The Mode C level reached F365 before descending back to F360.*
B	Flight crew climbing/descending without ATC Clearance
	Example: *At 0648, Aircraft A reported leaving cruise level FL340. The last level clearance was coincident with STAR issue at 0623, when the flight was instructed to maintain FL340. ATC was applying vertical separation between Aircraft A and two other flights. The timing of the descent was such that Aircraft A had become clear of the first conflicting aircraft and there was sufficient time to apply positive separation with the other.*
C	Incorrect operation or interpretation of airborne equipment (e.g. incorrect operation of fully functional FMS, incorrect transcription of ATC clearance or re-clearance, flight plan followed rather than ATC clearance, original clearance followed instead of re-clearance etc)
	Example: *The aircraft was maintaining a flight level below the assigned altitude. The altimeters had not been reset at transition. The FL assigned was 350.* *The aircraft was maintaining 346 for 4 min 46 s.*
D	ATC system loop error; (e.g. ATC issues incorrect clearance or flight crew misunderstands clearance message. Includes situations where ATC delivery of operational information, including as the result of hear back and/or read back errors, is absent, delayed, incorrect or incomplete, and may result in a loss of separation.)
	Example: *All communications between ATC and aircraft are by HF third party voice relay. Aircraft 1 was maintaining FL360 and requested FL380. A clearance to FL370 was issued, with an expectation for higher levels at a later point. A clearance was then issued to Aircraft 2 to climb to F390, this was correctly read back by the HF operator, but was issued to Aircraft 1. The error was detected when Aircraft 1 reported maintaining F390.*
E	Coordination errors in the ATC to ATC transfer or control responsibility as a result of human factors issues (e.g. late or non-existent coordination, incorrect time estimate/actual, flight level, ATS route etc not in accordance with agreed parameters)
	Example 1: *Sector A coordinated Aircraft 1 to Sector B at FL380. The aircraft was actually at FL400.* Example 2: *The Sector A controller received coordination on Aircraft 1 for Waypoint X at F370 from Sector B. At 0504 Aircraft 1 was at Waypoint X at F350 requesting F370.*
F	Coordination errors in the ATC to ATC transfer or control responsibility as a result of equipment outage or technical issues

Code	LHD Cause
Operational Errors	
Aircraft Contingency Events	
G	Deviation due to aircraft contingency event leading to sudden inability to maintain assigned flight level (e.g. pressurization failure, engine failure)
H	Deviation due to airborne equipment failure leading to unintentional or undetected change of flight level
Deviation due to Meteorological Condition	
I	Deviation due to turbulence or other weather related cause
Deviation due to TCAS RA	
J	Deviation due to TCAS resolution advisory, flight crew correctly following the resolution advisory
K	Deviation due to TCAS resolution advisory, flight crew incorrectly following the resolution advisory
Other	
L	An aircraft being provided with RVSM separation is not RVSM approved (e.g. flight plan indicating RVSM approval but aircraft not approved, ATC misinterpretation of flight plan)
M	Other – this includes situations where: i) there has been a failure to establish or maintain a separation standard between aircraft; or ii) flights are operating (including climbing/descending) in airspace where flight crews are unable to establish normal air-ground communications with the responsible ATS unit.

Table 2: Taxonomy with Examples

3. ACTION BY THE MEETING

3.1 The meeting is invited to

a) urge States to take the following action for MAAR;

- States provide RVSM approvals records;
- Annual update of RVSM approvals be provided to MAAR; and
- Aircraft registration field be provided as part of the TSD.

b) note the most common locations (Top 5) where such events occurred in term of duration included ARESI, GORAI, LAXOR, SADAN and PEDNO; and

c) consider establishing a side meeting among States concerned to address the persistent Category E LHD occurrences.

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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 23 February 2011)

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
Australian Airspace Monitoring Agency (AAMA) - Airservices Australia http://www.airservicesaustralia.com/organisations/aama/default.asp Mr. Robert Butcher, Operational Analysis Manager, Safety and Assurance Group email: robert.butcher@airservicesaustralia.com or aama@airservicesaustralia.com	Australia	APANPIRG RMA	Current	Brisbane, Honiara, Jakarta, Melbourne, Nauru, Port Moresby and Ujung Pandang (including Timor-Leste) FIRs
		EMA	Current	Brisbane, Melbourne 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 (secure site) Mr. Tang Jinxiang, Engineer of Safety and Monitoring Technical Group, ATMB email: tangjx@adcc.com.cn	China	APANPIRG RMA	Current	Beijing, Guangzhou, Kunming, Lanzhou, Shanghai, Shenyang, Urumqi Wuhan Sanya and Pyongyang FIR.
JCAB RMA - **Japan Civil Aviation Bureau** Mr. Noritoshi Suzuki, Special Assistant to the Director, Flight Procedures and Airspace Program Office, email: suzuki-n248@mlit.go.jp	Japan	APANPIRG RMA	Current	Fukuoka FIR
		EMA	Available fourth quarter – 2011	Fukuoka FIR

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
Monitoring Agency for the Asia Region (MAAR) – Aeronautical Radio of Thailand LTD http://www.aerothai.co.th/maar Mr. Nuttakajorn Yanpirat, Executive Officer, Systems Engineering,Aeronautical Radio of Thailand Ltd. email: nuttakajorn.ya@aerothai.co.th or maar@aerothail.co.th	Thailand	APANPIRG RMA	Current	Bangkok, Kolkatta, Chennai, Colombo, Delhi, Dhaka, Hanoi, Ho Chi Minh, Hong Kong, 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	APANPIRG RMA	Current	Anchorage Oceanic, Auckland Oceanic, Incheon, Nadi, Oakland Oceanic, Tahiti FIRs
		EMA	Current	Anchorage Oceanic, Oakland Oceanic
South East Asia Safety Monitoring Agency (SEASMA) - Civil Aviation Authority of Singapore (CAAS) Mr. Kuah Kong Beng, Chief Air Traffic Control Officer, email: KUAH_Kong_Beng@caas.gov.sg	Singapore	EMA for South China Sea	Current	Hong Kong, Ho Chi Minh, Kota Kinabalu, Kuala Lumpur, Manila, Sanya and Singapore FIRs

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
FIT - SEA (ICAO Regional Office email icao_apac@bangkok.icao.int & **CRA Japan** Mr. Mitsuo Hayasaka, Deputy Director, Air Traffic Control Association Japan, email:hayasaka@atcaj.or.jp	ICAO Regional Office & CRA Japan	FIT & CRA	Current	South China Sea FIRs
IPACG/FIT Mr. Takahiro Morishima, JCAB Co-Chair email: morishima-t2zg@mlit.go.jp & Mr. Reed Sladen, FAA Co-Chair, email: reed.b.sladen@faa.gov	Japan & USA	FIT & CRA	Current	North & Central Pacific (Oceanic airspace within Fukuoka FIR, and Anchorage & Oakland FIRs)
CRA Japan Mr. Mitsuo Hayasaka, Deputy Director, Air Traffic Control Association Japan, email: hayasaka@atcaj.or.jp	Japan	CRA	Current	Fukuoka FIR for IPACG/FIT Ho Chi Minh, Manila, Singapore FIRs for FIT-SEA

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
FIT - BOB ICAO Regional Office email icao_apac@bangkok.icao.int & Mr. Bradley Cornell, Boeing Engineering email: Bradley.D.Cornell@Boeing.Com	ICAO Regional Office & Boeing USA	FIT & CRA	Current	Bay of Bengal FIRs, Ujung Pandang and Jakarta FIRs, provides assistance to the members of the Arabian Sea/Indian Ocean ATS Coordination Group (ASIOACG)
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)