INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

REPORT OF THE ELEVENTH MEETING OF THE SOUTH-EAST ASIA ATS COORDINATION GROUP (SEACG/11) AND FIRST FANS IMPLEMENTATION TEAM, SOUTH-EAST ASIA (FIT-SEA/1) MEETING

Bangkok, Thailand, 24 to 28 May 2004

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

Approved by the Meeting
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PART I – HISTORY OF THE MEETING

1. **Introduction**

1.1 The Eleventh Meeting of the South-East Asia ATS Co-ordination Group (SEACG/11) and the First Meeting of the FANS Implementation Team, South-East Asia (FIT-SEA/1) were held at the Kotaite Wing, ICAO Asia and Pacific Regional Office, Bangkok, Thailand between 24 to 28 May 2004.

2. **Attendance**

2.1 The meeting was attended by 53 participants from Cambodia, China, Hong Kong China, Indonesia, Japan, Lao PDR, Malaysia, Philippines, Singapore, Thailand, Viet Nam, IATA, IFALPA, IFATCA, and one (1) Data Link Service Provider, SITA. A list of participants is at **Attachment 1**.

3. **Officers and Secretariat**

3.1 Mr. David J. Moores, Regional Officer ATM from the ICAO Asia and Pacific Office, Bangkok acted as the Moderator and was assisted by Mr. K.P. Rimal, RO/CNS of the ICAO Asia and Pacific Office. Mr. Andrew Tiede, RO/ATM served as the Secretary for the meeting.

4. **Opening of the Meeting**

4.1 Mr. David Moores on behalf of Mr. Lalit B. Shah, Regional Director, ICAO Asia and Pacific Regional Office welcomed the participants to Bangkok. He explained that the eleventh meeting of SEACG and the first meeting of FIT-SEA had been combined to maximize resources, and to be able to fit the meetings into a busy schedule leading up to the fourteenth meeting of the ATM/AIS/SAR Sub-Group on 28 June-2 July followed by the fifteenth meeting of APANPIRG on 23-27 August 2004.

4.2 The FIT-SEA is being set up to facilitate and foster the implementation of data link services, such as automatic dependent surveillance (ADS) and controller pilot data link communications (CPDLC) in the non-radar oceanic airspace in the South-East Asia area and in particular on the South China Sea route structure. This was in accordance with the requirements in the Asia/Pacific Air Navigation Plan (Doc 9673) and the Asia/Pacific Regional Plan for CNS/ATM Systems, both of which were in line with the ICAO Global Air Navigation Plan for CNS/ATM Systems. It should be noted that the basic operational requirements and planning criteria for regional planning requires that surveillance should be provided as an integral part of air traffic control and ADS may be used in airspace where radar is impracticable. Under APANPIRG's Key Priorities for CNS/ATM Implementation in the Asia/Pacific Region, Key Priority 6 calls for implementation of ADS in oceanic and remote airspace for the enhancement of safety and air traffic management. Also, it should be recognized that the airspace users for a considerable time have been seeking an accelerated implementation of data link services as there were significant operational benefits and safety enhancements to be gained from the use of data link for surveillance and communications where HF is currently being used. This meeting will be expected to examine the issues involved and consider the development of an implementation plan for the areas concerned. The States in the Bay of Bengal area had reconvened the FIT-BOB for the Bay of Bengal area in September 2003 and an operational trial of ADS and CPDLC commenced in February 2004.

4.3 In regard to SEACG/11, the meeting had been postponed in 2003 due to the outbreak of the Severe Acute Respiratory Syndrome (SARS) that affected the Asia Region in early 2003. There were a number of outstanding operational matters that require further action in respect to the efficient operation of the South China Sea routes, ATM arrangements, RVSM operations, etc.

4.4 Nominations to Chair the meeting were invited from participating States. As a Chairperson had not been forthcoming for this meeting, Mr. Moores would act as the Moderator. Although this meeting was a combined meeting, it was likely in the future that FIT-SEA would hold separate meetings from SEACG in order to meet the increased workload and need for more frequent meetings once the operational trial of ADS/CPDLC commenced.

4.5 Mr. Moores noted that some participants would be enjoying for the first time the new conference facilities of the Regional Office which had generously been provided to ICAO by the Royal Thai Government. He wished the meeting a successful outcome.

5. Documentation and Working Language

5.1 The working language of the meeting and the language for all documentation was in English. Thirteen (13) Working Papers and two (2) Information Papers were presented to the SEACG/11 meeting, and ten (10) Working Papers and four (4) Information Papers were presented to the FIT-SEA/1 meeting. The list of papers is shown at **Attachment 2**.

REPORT OF THE FIT-SEA/1 MEETING

Agenda Item 1: Introduction and Adoption of Revised Provisional Agenda

1.1 The meeting reviewed the revised provisional agenda. The following revised Agenda was adopted by the meeting:

Agenda Item 1:	Introduction and Adoption of Revised Provisional Agenda
Agenda Item 2:	Establishment of a FANS Implementation Team for SEA
Agenda Item 3:	Adoption of FIT-SEA Terms of Reference and Work Plan
Agenda Item 4:	Operations procedures document
Agenda Item 5:	Selection and establishment of a Central Reporting Agency
Agenda Item 6:	Establishment of operational trial
Agenda Item 7:	Data link monitoring requirements
Agenda Item 8:	Any other business
Agenda Item 9:	Venue for the FIT-SEA/2 meeting

Agenda Item 2: Establishment of a FANS Implementation Team for SEA

2.1 The Secretariat reminded the meeting that the States responsible for the provision of air navigation services for the international airspace in the South-East Asia area would be expected to implement the CNS/ATM systems required in the Asia/Pacific Region Air Navigation Plan (Doc 9673) and the Regional Plan for New CNS/ATM Systems. The meeting recognized that ADS/CPDLC would provide significant improvements in ATM for the oceanic procedural non-radar airspace in the region, and where HF communications was the primary means of communication. In this regard, it was noted that once a CPDLC logon had been established between the pilot and ATC, CPDLC would become the primary means of direct controller pilot communications and HF used as a secondary means. The Secretariat reminded the meeting that Annex 2 requires a controlled flight to maintain continuous air-ground voice communication watch and this requirement remains in effect after CPDLC has been established. In regard to ADS operations, once an ADS contract had been established with ATC for position reporting, pilots should not be required to make routine position reports on HF or CPDLC. This in effect created a silent communication environment, with ATC receiving automatic position reports.

2.2 The ASIA/PAC ANP, Facilities and Services Implementation Document (FASID) includes requirements for States to implement ADS/CPDLC systems. The meeting was reminded that APANPIRG's List of Key Priorities for CNS Implementation in the Asia/Pacific Region includes Key Priority 6: *The implementation of ADS in oceanic or remote areas in accordance with the Regional CNS/ATM Plan is required for the enhancement of safety and ATM.*

2.3 The meeting recognized that under Annex 11, States were required to implement systematic and appropriate ATS safety management programmes to ensure safety was maintained in the provision of ATS within airspaces. In the case of providing ADS and CPDLC services in the South-East Asia area, the meeting noted that States were obligated to establish safety arrangements to ensure that the appropriate TLS was met and maintained.

2.4 During the course of the APANPIRG/14 meeting, it was noted (paragraph 2.1.104 of the report) that in recognition of the effectiveness of the FANS Interoperability Teams (FIT) operating in the Pacific Region under ISPACG and IPACG (PAC-FIT) and the FANS Implementation Team operating in the Bay of Bengal area (FIT-BOB), a similar mechanism should be established to progress FANS issues in the South-East Asia area.

2.5 The meeting agreed that in order to establish integrated ADS and CPDLC services for the provision of ATS services in the South-East Asia area, it would be necessary to establish a FIT-SEA. Membership of FIT-SEA would be open to all interested parties, including:

a) South-East Asia States with CNS/ATM work stations;

b) Data link Service Providers (DSPs) (ARINC, SITA & INMARSAT);

c) Aircraft manufactures (Boeing & Airbus);

d) ICAO;

e) International Organisations, and

f) Representatives of participating airlines.

2.6 The FIT-SEA would need to establish the implementation plan, identify the airspace where data link services would be implemented and establish an operational trial. The meeting agreed that in setting up the FIT-SEA, consideration should be given to following the FIT-BOB model and adopting the FIT-BOB documentation as appropriate.

2.7 The meeting was updated by States responsible for the non-radar airspace over the South China Sea (SCS) on their preparedness to implement ADS and CPDLC. Only Singapore had implemented data link services and was operating ADS and CPDLC since 1997 for ATC in the Singapore FIR. The meeting recognized that as a result of the low level of equipage amongst SCS States, there would be some delay in commencing an integrated operational trial of ADS/CPDLC in the SCS area , probably not until 2006/2007. In light of the delays expected, the meeting agreed that the development of the main work programme would be deferred until the next meeting of FIT-SEA, at which time further information was expected to be available on the status of the facility upgrades of a number of States which were currently at an early stage, and the consequent preparedness of States to commence a trial.

2.8 IATA commented that the users expected States to provide surveillance capability for the non-radar airspace, as improving situational awareness for ATC had a positive impact on safety, as well providing significant benefits for operational efficiency and regularity of flights. On the SCS routes, there was a major area in the middle portion of the airspace outside radar and VHF coverage. Providing data link capability to fill the gap would derive benefits that the airline industry fully supported. IATA expressed disappointment in the delay by States to implement ADS and CPDLC especially in view of the large number of FANS-1/A equipped aircraft operating on these routes, and in view of the requirements of the Asia/Pacific ANP.

2.9 The meeting recognized that it was important to maintain momentum towards implementation and establishment of the FIT-SEA would facilitate this process. Preparatory work could be usefully undertaken to minimize delay in implementation once States were in position to commence an operational trial. Accordingly, the meeting agreed to form the FANS Implementation Team for the South-East Asia area (FIT-SEA).

2.10 Japan suggested to the meeting that when new ATM equipment was purchased that it should include data analysis tools to facilitate data being available for safety analysis, thereby avoiding the need to upgrade equipment after purchase. The meeting agreed that States should take this into account when planning for ATM system upgrades.

Agenda Item 3: Adoption of FIT-SEA Terms of Reference and Work Plan

3.1 The meeting reviewed the Terms of Reference (TOR) (**Appendix A**) and initial Work Plan (**Appendix B**) proposed by the Secretariat. The proposal was derived from the TOR and initial work plan adopted by the FIT-BOB after discussions at the FIT-BOB/2 meeting (8-12 September 2003). The FIT-BOB meeting also included a review of the Pacific FIT TOR and Work Plan. The meeting agreed that the proposed TORs met the requirements for the establishment of the FIT-SEA and that the proposed Work Plan was suitable for its initial activities. The TOR and Work Plan were accepted by the meeting.

Agenda Item 4: Operations procedures document

4.1 The Secretariat briefed the meeting on the outcome of the APANPIRG Review of the *Guidance Material on CNS/ATM Operations in the Asia and Pacific Region* Task Force meeting hosted by the Federal Aviation Administration (FAA) of the United States at Honolulu, Hawaii, in October 2003. The Task Force was set up by APANPIRG/14 (August 2002) under Conclusion 14/2 to review the regional *Guidance Material on CNS/ATM Operations in the Asia and Pacific Region* (referred to hereafter as the *Guidance Material*). APANPIRG/14 had taken action on the request of the Air Navigation Commission to ensure that the regional *Guidance Material* was in accordance with the SARPs and PANS, and in particular with Amendment 1 to the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444).

4.2 The meeting was reminded that ICAO had carried out a detailed technical review of the *Guidance Material* in light of Amendment 1 to PANS-ATM, which included ADS operating procedures, and had recommended to the Commission that there was a need to harmonize the *Guidance Material* with ICAO provisions. The Commission also wished to see other ADS/CPDLC operating procedures being used by States brought in line with ICAO provisions to the extent possible. In this regard, APANPIRG/14 requested the Task Force to coordinate its work with States responsible for the Pacific Operations Manual (POM) with the intent of harmonizing both documents.

4.3 The Task Force carried out a detailed review of the *Guidance Material,* and a revision to the document was under preparation, which had been harmonized with the POM. The meeting was reminded that Part IV of the *Guidance Material* was based on the POM and was substantially the same with minor editorial differences. Therefore, States when using the POM would be following operating procedures supported by the ICAO Asia/Pacific Region *Guidance Material*.

4.4 The ICAO Secretariat requested that consideration be given to changing the generic title of the document in order to more accurately reflect the content of the document which related to the FANS-1/A aircraft systems and their global application. The United States agreed to bring this to the next ISPACG meeting to be held in Fiji on 23-27 February 2004, and would recommend that the POM be titled the FANS-1/A Operations Manual (FOM). The ISPACG/18 meeting concurred with this position and the document title was changed to FOM, reflecting the suitability of these procedures for application across all FANS operations in the Asia Pacific Region. The meeting noted the recency of the change in name of the procedures document and was made aware that it would take some time for all States to incorporate the name change. As such, it was likely that the terminology FOM and POM would overlap for a while, until the change in title to FOM was broadly propagated. It was important to note that the document dated 1st March 2004 was the current version of the FOM, and a copy was distributed to the meeting, and an electronic copy is available at the Regional

Office.

4.5 The meeting emphasized the importance for States to review their operational procedures and revise them in line with the FOM. States were reminded that there were significant operational and safety issues related to not using common operating procedures, and this matter should be given high priority. Also, training of controllers and technical staff on the FANS-1/A operating procedures was crucial. The meeting was advised that support and assistance with any matter related to the FOM was readily available.

4.6 The meeting was reminded that FANS-1/A had been in use in the Pacific Region since about the mid-1990's and considerable operating experience had been gained. Many valuable lessons had been learnt that led to improvements to the overall system performance. The experience available through the FANS-1/A implementation in the Pacific had been utilised by the FIT-BOB during the relatively recent introduction of ADS/CPDLC in portions of the Bay of Bengal area. The experience gained by the FIT-BOB was also available to FIT-SEA. In addition, SITA advised that a substantial listing/record of "lessons learnt" as a result of CRA analysis in other regions was available and was intended for distribution to interested parties. As a consequence of the above, a considerable body of knowledge and experience was available which would benefit the FIT-SEA in managing the introduction of ADS/CPDLC in the South China Sea area.

Agenda Item 5: Selection and establishment of a Central Reporting Agency

5.1 The Secretariat briefed the meeting that the establishment of a CRA was critical to enabling States to implement operational ADS and CPDLC systems. The CRA performs the essential technical analysis of the performance of these systems and undertakes the investigation of system failures and other technical malfunctions. This was essential to trace the cause of problems whether in the aircraft or ground systems, and to initiate remedial action by the responsible parties. The meeting agreed that operation of ADS and CPDLC in an operational air traffic control environment was safety critical, and the performance of aircraft and ground ADS and CPDLC systems, and their potential contribution to operational risk, must be thoroughly evaluated and effective monitoring carried out prior to implementation and for ongoing operations. The meeting noted that the tasks performed by a CRA were highly specialized and required test equipment and simulation capability that was not readily available.

5.2 The Secretariat reminded the meeting that ICAO has not developed SARPs for FANS-1/A applications – including airborne and ground systems and the data service providers. Consequently, the appropriate Collision Risk Models (CRM) used to derive separation minima effectively formed the ICAO "SARPs", and the onus was on States to demonstrate that their ADS/CPDLC systems and operation met the performance parameters in the CRMs for application of reduction in separation minima using data link services. These models can be found in the *Manual on Airspace Planning Methodology for the Determination of Separation Minima* (Doc 9689). The analysis and investigation activities of the CRAs were essential in determining whether a State was meeting the CRM requirements. The meeting agreed that the appointment of a CRA for the South-East Asia area was essential.

5.3 In considering the issue of a suitable service provider for the CRA for FIT-SEA States, the meeting was advised that Boeing (who was operating the CRA for the Pacific Region) had confirmed at the FIT-BOB/2 meeting (8-12 September 2003) that they would be willing to provide CRA services to the States of FIT-BOB to support the operational trial and implementation of ADS and CPDLC services. Accordingly, IATA and Boeing were requested by FIT-BOB to pursue the establishment of a contract on behalf of the FIT-BOB States participating in the operational trial for Boeing to set up and operate the CRA. IATA agreed to the arrangements and would work with Boeing to evaluate the costs of operating the CRA, arrange for a contract with Boeing, and collect the funds from the airspace users concerned. IATA advised the FIT-SEA/1 meeting that, with regard to the FIT-BOB operational trial, the contract negotiations with Boeing were continuing with a view to finalizing appropriate contract arrangements. As Boeing was not represented at the FIT-SEA meeting, no discussion has been undertaken with Boeing regarding the FIT-SEA CRA issues.

5.4 Japan presented information on the roles and activities presently being undertaken by the CRA Japan in support of operations in the North Pacific. The Japan CRA commenced activities in May 2001 and has CRA responsibilities for the Tokyo FIR.

5.5 The CRA of Japan advised the meeting that information on their activities could be obtained from the CRA website at http://www.crasa.cra-japan.org. Some of the information on the website was confidential to the IPACG and ISPACG FIT members, however there was a lot of additional information available. The CRA of Japan advised that email queries addressed to crasa@cra-japan.org would be answered.

5.6 The CRA of Japan offered to undertake the role of CRA for the South China Sea States, as an extension to its existing activities. The meeting noted the considerable experience gained by the Japan CRA and recorded appreciation for the offer from the CRA of Japan. In the following discussions the meeting sought clarification of the respective roles of the CRA of Japan and its relationship with Boeing, with a view to fully understanding whether the South China Sea CRA activities would be undertaken exclusively by the CRA of Japan or whether Boeing would have a role and if so, the extent of that role. As this information was no (October 2004) and FIT-SEA meetings as to exactly what was proposed by the CRA of Japan.

5.7 The meeting had noted that there would be some delay in commencing an operational trial in the SCS (2006/2007). In light of the delays expected, IATA and a number of States suggested that the selection of a CRA could be delayed until closer to the commencement of the trial. The meeting agreed that the situation would be deferred until the next meeting of FIT-SEA, at which time further information was expected to be available about the CRA Japan proposal and experience would have been gained with the FIT-BOB CRA.

Agenda Item 6: Establishment of operational trial

Updates by States on their data link capability

China and Hong Kong, China

6.1 China and Hong Kong, China informed the meeting that the Sanya Area of Responsibility (AOR) and the Hong Kong FIR would have full radar and VHF coverage in the near future when China completed its radar implementation programme. Hong Kong China would be receiving a radar feed from China to cover a small area in the southern part of their FIR presently outside radar coverage. Accordingly, there was no requirement to provide ADS and CPDLC services over the South China Sea for the airspace under their responsibility.

Indonesia

6.2 Indonesia provided information on preparations by ANGKASA PURA II to implement ADS/CPDLC services in the Jakarta FIR. ADS/CPDLC were sub-systems to the Jakarta Automated Air Traffic Control Systems (JAATS) installed in June 1996, with service being provided by ARINC.

6.3 The ADS was operated from a stand alone workstation but it could be integrated into JAATS by using the AFTN to update flight plans in JAATS, and updating of track position on the display. There have been software problems and messages from FANS-A equipped aircraft were unable to be processed. This problem was being rectified and full operational implementation may be possible this year. Indonesia was participating in the Bay of Bengal operational trial for the oceanic airspaces in the western part of the Jakarta FIR. However, because ADS/CPDLC was operating in a stand alone mode, it was not possible to implement ADS/CPDLC services for the entire Jakarta FIR. Further, most of the Jakarta FIR was covered by radar and VHF communication.

6.4 In the eastern part of the Jakarta FIR, ADS/CPDLC services would be implemented on routes from Singapore to Australia where these States are providing ADS/CPDLC: route B470 – A585 (ANITO – SAPDA), B470 – B469 (ANITO – LAMOB), N752 (ATMAL – PARDI) at F350 or above.

Japan

6.5 Japan provided information on the lessons learnt and experience gained by the States and industry partners in the course of developing and implementing ATS data link operations in the Asia/Pacific Region. Through the pioneering work for the first operational data link services for ATS implemented in the Pacific Region, a variety of difficulties had been faced which had never been experienced before. With seven years of experience operating ADS/CPDLC in the Tokyo FIR, which handled approximately 47,000 flights annually by FANS aircraft, JCAB, as the ATS service provider, recognized that information sharing was the most effective means to resolve issues and enhance safe and efficient implementation of ADS/CPDLC technologies.

6.6 With the implementation of advanced ADS/CPDLC systems, a seamless data link single airspace was becoming a reality in the North, Central and South Pacific airspace. The Bay of Bengal had also commenced an operational trial of ADS/CPDLC. With the States in South-East Asia now considering implementation of ATS data link services, it should be possible to establish seamless data link operations in the Asia/Pacific Region. This would serve to support air traffic growth and, eventually, economic growth in the region.

6.7 Detailed information was provided on ATS data link services being provided by JCAB in the Tokyo FIR. This included data on traffic activity and the number of data link messages being handled, e.g. of the 47,000 flights per year in the Tokyo FIR (30 percent of all oceanic flights and almost 50 percent of aircraft in the North Pacific airspace), the average number of data link messages was about 80,000 per month (2,700/day) including 55,000 ADS reports and 25,000 ADS requests. In regard to data link performance, 95 percent of ADS reports reach the ATS end systems within 56 seconds, 95 percent of ADS requests reach the aircraft within 1 minute and 32 seconds, and ADS uplink message success rate is 98.7 percent on average. In regard to CPDLC message usage, there were approximately 38,000 per month (1,200/day) including the uplink messages of approximately 14,000/month and downlink message of 24,000/month. Regarding CPDLC performance, 95 percent of messages reach receivers within 40 seconds and the CPDLC uplink message success rate was 98.1 percent on average. The number of FANS aircraft operating in the oceanic airspace of the Tokyo FIR had increased approximately 18 percent in a year.

6.8 With Japan's considerable involvement and experience with data link implementation, they would be willing to participate in FIT-SEA activities and provide technical and operational information including sharing experience in development and implementation of data ink based air traffic service.

6.9 The meeting appreciated Japan's participation in the FIT-SEA and recognized the considerable contribution they could make to the implementation effort in the South-East Asia area. The meeting was well aware of the importance of learning from the experience gained by others, and the invaluable information available would contribute to successful implementation.

Philippines

6.10 The Philippines informed the meeting that an ADS/CPDLC operational trial had been introduced in March 2002 using a standalone system, however the trial had been stopped after one year due to low utilization. The equipment used had been returned to the manufacturer as it was being replaced in their CNS/ATM project. The Philippines had developed a master plan for implementation of CNS/ATM systems in line with the Asia/Pacific Regional plan and it was expected that the project would be completed in 2007. At that time, the Manila ACC would have an integrated automated ATM system with ADS, CPDLC and new SSR radars, and they would be in a position to participate in the operational trial for the SCS.

Singapore

6.11 Singapore advised that they introduced ADS/CPDLC services in 1997 on a limited basis over the oceanic part of the Singapore FIR in the South China Sea area using a standalone workstation. In February 1999, the ADS/CPDLC system was integrated into their ATC system, LORADS II and the services extended to 24 hours from October 1999. The logon rate with FANS-1/A capable aircraft was above 90 percent. The meeting noted that without other States' participation it has not been possible to gain the full benefits of ADS/CPDLC services across the SCS airspace. The meeting appreciated the service provided by Singapore and the valuable experience gained.

Thailand

6.12 Thailand informed the meeting that the eastern part of the Bangkok FIR including the South China Sea airspace was covered by radar and VHF communications and they did not have a requirement to operate ADS/CPDLC. However, they were participating in the Bay of Bengal ADS/CPDLC operational trial for that part of the Bangkok FIR over the Bay of Bengal area for routes L515 and L759. They had implemented an ADS/CPDLC standalone system in 1996 to support operations on ATS route UM501, which had limited use and was eventually replaced by the EMARSSH routes implemented in 2002. Thailand was willing to participate in the airspace safety management activities for the data link trials and ongoing operations.

Viet Nam

6.13 Viet Nam provided information giving an overview of the air navigation system of the Civil Aviation Administration of Viet Nam (CAAV), and recent activities in air navigation planning and implementation process in Vietnam. CAAV had installed a nation-wide radar system comprising modern PSR/SSR stations located at Noibai/Hanoi, Danang and Tan Son Nhat/Ho Chi Minh, and SSR stations were located at Vinh, Phu Cat and Ca Mau**.** The coverage provided includes all of the Ha Noi FIR and a significant part of the Ho Chi Minh FIR. In the latter case, there was an area over the South China Sea beyond radar coverage and CAAV would provide ADS/CDLC systems under their new CNS/ATM Systems Transition and Implementation Plan, which was in accordance with the ICAO Regional Plan for CNS/ATM Systems. The radar and data link systems would be integrated and was expected to be completed in 2006, at which time Viet Nam would be able to participate in the ADS/CPDLC operational trial for the SCS area.

6.14 The VHF network included extended VHF stations located at Noibai/Hanoi, Vinh, Son Tra/Danang, Vung Chua/Phu Cat, Tan Son Nhat/Ho Chi Minh, Camau and one additional extended station was planned at Conson Island with coverage of 400 km at an altitude of 10,000m.

6.15 Viet Nam was pleased to inform the meeting that the ICAO Council had approved the recommendation of APANPIRG/14 for Viet Nam's membership to APANPIRG, and expressed its appreciation to ICAO, APANPIRG member States, other States and International Organizations for their support.

Cambodia and Lao PDR

6.16 In regard to Cambodia and LAO PDR, they had no requirement to implement ADS/CPDLC as they were landlocked countries with full radar and VHF coverage.

6.17 The meeting, on completing its review of the ADS/CPDLC capability of States involved in the South China Sea area, recognized that only Singapore was presently able to provide ADS/CPDLC services for the oceanic non-radar airspace of the Singapore FIR. The other airspaces involved were within the Ho Chi Minh and Manila FIRs. As indicated above, the ADS/CPDLC operational trial would require Viet Nam and the Philippines to complete their CNS/ATM projects and implement ADS and CPDLC. Accordingly, a full operational trial should be possible by 2007. During the interim, the States concerned would have sufficient time to complete all preparations and be ready to participate in the trial as soon as their systems were operational.

6.18 The meeting agreed that the South China Sea area ADS/CPDLC operational trial would be carried out by the Philippines, Singapore and Viet Nam. Indonesia would also participate in this trial for the eastern part of the Jakarta FIR (they were also participating in the Bay of Bengal trial).

ADS-B developments

6.19 The meeting noted that in addition to ADS and CPDLC implementation, States were considering ADS-B as a means to provide surveillance in non-radar areas using ground based systems. This would be a significant enhancement and would provide radar-like operations. The meeting was updated by the Regional Officer CNS on the work of the ICAO ADS-B Study and Implementation Task Force which held its second meeting in March 2004. The Task Force had not completed its work to develop an implementation plan for the region and there was no time table established. They were monitoring progress by a number of States to implement ADS-B systems, notably Australia who was presently implementing approximately 25 ADS-B ground stations to provide surveillance of the whole of Australian airspace not under radar cover. The Australian ADS-B system was expected to be operational in late 2005 or 2006. Indonesia advised that they were preparing an implementation plan for ADS-B to provide surveillance of non-radar areas using ground-based systems. Implementation was expected in 2005.

ATS Interfacility Data Exchange (AIDC)

6.20 The meeting was updated by the Regional Officer CNS on ATN developments. It was noted that with the automation in air traffic management, many coordination functions would be accomplished through data exchange between ATM systems using aeronautical telecommunications network (ATN) applications such as AIDC or ATS message handling service (AMHS). Planning for ATN should include provision of AFTN/AMHS gateways to facilitate the exchange of information between existing and newly established networks. APANPIRG had established the ATN Task Force to assist States to implement the ATN in the Asia/Pacific Region. The Task Force developed guidance material, the *Asia/Pacific Regional Interface Control Document* (ICD) for AIDC and the *Regional Router Interface Control Document* for the ATN network (ground/ground router), which has been published. However, requirements for AIDC have not yet been established and the ATN/TF held in April 2004 in Denpasar, Indonesia agreed to provide a table to specify requirements to be included in the ASIA/PAC FASID. The meeting noted that AIDC operational trials would need to be carried and some States were conducting such trials, e.g. Hong Kong/Guangzhou, Hong Kong/Bangkok and Japan/United States. The meeting would be kept informed on development with ATN implementation by States.

Agenda Item 7: Data Link monitoring requirements

7.1 The meeting reviewed the data link monitoring requirements that would need to be established for the commencement of an ADS and CPDLC operational trial and ongoing operations. In this regard, airspace safety monitoring programmes require monitoring for implementation and application of reduced separation minima such as reduced vertical separation, reduced horizontal separation using RNP, and separation based on ADS and CPDLC. The ATS data link applications supports the reduction in longitudinal separation, e.g. 30 and 50 NM using ADS and CPDLC, whereby distance-based separation replaces time-based separation.

7.2 In modern ATM automated systems, ATS data link functions as part of an integrated system including physical systems, human elements and procedures for use by pilots and controllers. Because of the integrated nature of the system and the degree of interaction among the components, end-to-end system monitoring was required. In this regard the FOM details the FANS-1/A requirements and procedures for the operation of aircraft and ground systems in a data link environment.

7.3 System monitoring involves routine collection of data necessary to ensure that the systems continue to meet performance, safety and interoperability requirements, and that operations and procedures were working as planned. The monitoring program was a two-fold process:

- periodic status reports that consist of the statistical data of system performance; and
- problem reports analysis and resolution.

7.4 The meeting noted that at the first meeting of RASMAG on 26-30 April 2004, draft guidance material for end-to end safety and performance monitoring of ATS data link systems in the Asia/Pacific Region was being developed (**Appendix C**). The meeting agreed that the guidance material would be used to set up and operate the data link monitoring services under the CRA for the South-East Asia area.

7.5 The meeting also noted that the role of RASMAG included reviewing and coordinating airspace safety monitoring activities in the Asia/Pacific Region and that the CRA would be required to report on its activities to RASMAG who reports to APANPIRG and the ATM/AIS/SAR/SG.

Agenda Item 8: Any other business

8.1 There was no further business.

Agenda Item 9: Date and venue for the FIT-SEA/2 meeting

9.1 The meeting agreed that the next meeting should be held jointly with SEACG/12, and the date and venue would be decided by the SEACG/11 meeting (SEACG/11 report, paragraph 7.1 refers).

FANS IMPLEMENTATION TEAM (FIT-SEA) FOR THE SOUTH CHINA SEA

DRAFT TERMS OF REFERENCE

Composition of FANS Implementation Team (FIT)

The FANS Implementation Team (FIT) will consist of representatives from aircraft and ancillary equipment manufacturers, airlines, data communication service providers (DSP), ATS providers, IATA, ICAO, IFALPA, and IFATCA.

FIT-SEA Terms of Reference (TOR)

The FANS Implementation Team for the South East Asia region (FIT-SEA) shall be responsible for system configuration and oversee the end-to-end monitoring process to ensure the FANS 1/A systems are implemented and continue to meet their performance, safety, and interoperability requirements.

FIT-SEA shall:

a) Determine the common operational architecture to support CPDLC and ADS;

b) Support the implementation and operational benefits of CPDLC and ADS;

c) Authorize and coordinate system testing and operational trials;

d) Develop interim operational procedures to mitigate the effects of problems until such time as they are resolved;

e) Review de-identified problem reports and determine appropriate resolution;

f) Monitor the progress of problem resolution; and

g) Assess system performance based on information in Central Reporting Agency periodic reports.

Preparation of Reports

The Central Reporting Agency (CRA) will report, as required, to FIT-SEA. FIT-SEA will report to the South East Asia ATS Co-coordinating Group (SEACG). ICAO will submit reports to appropriate sub-groups of APANPIRG.

FIT-SEA WORK PLAN

1. Develop and sign a data confidentiality agreement between South East Asia States, airlines using FANS 1/A in the South East Asia region, Data Link Service Providers (DSPs) and the CRA. This agreement ensures that team members can submit identified problem reports to the CRA to facilitate problem resolution and that all problem reports will be de-identified before dissemination to the entire FIT-SEA team.

   Action: CRA/States/Airlines/DSPs coordinate with CRA to sign data confidentiality agreement

2. Adopt the FANS 1/A Operations Manual (FOM) and ICAO regional *Guidance Material on CNS/ATM Operation in the Asia/Pacific Region* to establish operating and reporting procedures in the South East Asia region.

   Action: FIT-SEA members make appropriate arrangements to incorporate technical, training and documentation aligned with the FOM and ICAO Guidance Material.

3. States/ATSU Providers to ensure controllers are trained to operate their respective FANS 1/A workstations using the FOM and ICAO *Guidance Material on CNS/ATM Operations in the Asia/Pacific Region* as a basis for developing training.

   Action: FIT-SEA ATSUs adopt training requirements.

4. Participating operators to ensure flight crews are trained to operate their respective FANS 1/A systems using the FOM and ICAO regional *Guidance Material on CNS/ATM Operations in the Asia/Pacific Region* as a basis for developing training. To obtain operational approval for FANS 1/A from their regulatory authorities as required, operators should take into account appropriate technical material such as: FAA documents *"Controller-To-Pilot Data Link Communication Operational Approval Information Package"* dated 25 February 1999 and FAA AC 120-70.

   Action: Operators to implement training requirements as designated by appropriate regulatory authorities.

5. Co-ordinate with all FANS 1/A equipped operators prior to the start of ADS/CPDLC operational trials and urge them to participate.

   Action: States/ATSUs to coordinate with operators and IATA for FANS 1/A trial participation.

DRAFT GUIDANCE MATERIAL FOR END-TO-END SAFETY AND PERFORMANCE MONITORING OF AIR TRAFFIC SERVICE (ATS) DATA LINK SYSTEMS IN THE ASIA/PACIFIC REGION

1. Background

1.1 The Asia Pacific Airspace Safety Monitoring (APASM) Task Force established by the Asia Pacific Air Navigation Planning Implementation Regional Group (APANPIRG) noted that requirements for monitoring aircraft height-keeping performance and the safety of reduced vertical separation minimum (RVSM) operations had been more comprehensively developed than for other Air Traffic Management (ATM) services, such as reduced horizontal separation based on required navigation performance (RNP), and monitoring of Air Traffic Services (ATS) data link systems. For RVSM, a handbook with detailed guidance on the requirements for establishing and operating Regional Monitoring Agencies (RMA) was at an advanced stage of development by the International Civil Aviation Organization (ICAO) ICAO Separation and Airspace Safety Panel (SASP) and was expected to be completed early in 2004. There was no comparable document under development by ICAO for Air Traffic Control data link communication applications. The APASM Task Force agreed that there was a requirement to develop guidance material for the Asia/Pacific Region covering safety and performance monitoring for ATS data link applications, which could also serve as a basis for global guidance.

1.2 The experience gained by the Informal Pacific ATC Coordinating Group (IPACG) and the Informal South Pacific ATS Coordinating Group (ISPACG) FANS Interoperability Teams (FITs) and the supporting Central Reporting Agency (CRA) to monitor automatic dependent surveillance (ADS) and controller pilot data link communications (CPDLC) performance for both aircraft and ground systems, was used as a resource on which to develop monitoring guidance material.

2. Purpose of Guidance Material

2.1 The purpose of this guidance material is to provide a set of working principles common to all States implementing ATS data link systems. The guidance material is also intended to provide assist with detailed guidance on the requirements for establishing and operating a FIT. It is intended that this guidance material will help promote a standardized approach for implementation within the Region. This information will also help to promote interchange of information among different Regions to support common operational monitoring procedures.

3. Description of an ATS Data Link Regional Monitoring Agency

3.1 Unlike many other systems, the technologies adopted to provide ATS data link functionality exist in several different domains (e.g. aircraft, space, ground network, air traffic service units, human factors) and the elements in all domains must be successfully integrated. Avionic and ground equipment from many different vendors, as well as the sub-systems of several different communication networks, must inter-operate to provide the required end-to-end system performance. In addition, procedures must be coordinated among many different airlines and countries to provide the desired operational performance. Technical and operational elements must then coalesce to allow the environment to demonstrate mature and stable performance. Only then can essential benefits be realized.

3.2 Realization that an interoperability team approach was essential to the success of any ATS data link implementation was an important lesson learned by the ISPACG, who first implemented CNS/ATM applications using FANS 1/A systems. . Stakeholders had worked together well during the initial development and subsequent certification of FANS-1/A. ISPACG members expected benefits from FANS-1/A soon after in-service operations began even though a problem-reporting system was in place when FANS-1/A operations commenced, many problems went unresolved and it was not immediately possible to adopt the new operational procedures that would result in higher traffic capacity and more economic routes. Therefore, a FANS Interoperability Team was formed to address both technical and procedural issues and help to ensure that benefits would result. However, the ISPACG also realized that a traditional industry team approach would not be effective. Daily attention and/or significant research were required if the many issues were to be adequately resolved. To address these concerns, the FIT created a dedicated sub-team, the CRA, to perform the daily monitoring, coordination, testing, and problem research tasks outlined by the FIT. This approach is similar to that taken for RVSM implementations where supporting groups provide aircraft height keeping monitoring services.

3.3 Although the monitoring process described above was first developed for FANS-1/A based CPDLC and ADS applications the monitoring process is identical for Aeronautical Telecommunications Network (ATN) based ATS applications as well. This was validated during the Preliminary Eurocontrol Test of Air/ground data Link (PETAL) implementation of ATN based ATS data link services in Maastricht Area Control Center.

3.4 The principal members of an interoperability team are the major stakeholders of the systems that must interoperate to achieve the desired system performance and end-to-end operation. In the case of ATS data link systems, such as FANS-1/A or AT N, the major stakeholders are aircraft operators, ATS providers, communications network service providers, and airframe manufacturers. Other stakeholders such as regulators, pilot and controller associations, as well as international organizations, also play an important role.

3.5 Interoperability teams should be established to oversee the problem reporting and end-to-end system performance monitoring processes. They monitor system performance for a given region and act on reported problems. Any safety-related issues discovered by the team should be referred to the appropriate State or regulatory authorities for action. These processes were designed to ensure that the ATS data link systems meet established performance and interoperability requirements and to confirm that operations and procedures are working as planned. As a result of these aims and of subsequent evolution, the terms of reference for an interoperability team monitoring ATS data link systems are the following:

Problem Identification and Resolution

- establishing a problem reporting system;
- reviewing de-identified problem reports, and determining appropriate resolution;
- identifying trends;
- developing interim operational procedures to mitigate the effects of problems until such time as they are resolved;
- monitoring the progress of problem resolution; and
- preparing summaries of problems encountered and their operational implications for regional dissemination.

System Performance

- determining and validating system performance requirements;
- establishing a system performance monitoring system;
- assessing system performance based on information in CRA monthly reports;
- authorizing and coordinating system testing;

- identifying accountability for each system element. Developing, documenting and implementing a quality assurance plan that will provide a path to a more stable system; and
- identifying configurations of the end-to-end system that provide acceptable data link performance, and ensuring that such configurations are maintained by all stakeholders.

Achieving Benefits

- formulating plans for long-term procedural enhancements that take advantage of ATS data link benefits;
- coordinating testing in support of implementation of enhanced operational procedures such as:
  - reduced separation;
  - Dynamic Airborne Route Planning (DARP) procedures, such as those which have been implemented on South Pacific routes providing some of the first tangible benefits from FANS-1/A; and
  - user-preferred routing, in which operators define their own flexible tracks, promises to provide greater incremental economic benefits than DARP.

***Note**. ? Benefits available from ATS data link systems will differ from region to region. The benefits listed above are an example of benefits being sought by the South Pacific FIT.*

Reporting

- providing annual summary reports to appropriate steering groups; and
- forward reports from the FIT to other interested industry teams.

4. CRA Description

4.1 In order for an interoperability team to achieve its important goals of problem resolution, system performance assurance, and planning and testing of operations that will enable benefits, work must be done on a daily basis. To address these concerns a dedicated sub-team, such as the CRA, is required to do the daily monitoring, coordination, testing, and problem research tasks outlined by the terms of reference for the interoperability team.

4.2 CRA Resource Requirements

4.2.1 To be effective, the CRA must have two main components: dedicated staff and adequate tools. Staffing requirements will vary depending on the complexity of the region being monitored. There are several factors that affect regional complexity from an ATS monitoring standpoint such as dimensions of the airspace, variety in operating procedures, number of airlines, number of different airborne equipment variants, number of air traffic service providers, number of different ground equipment variants and number of communications network service providers.

4.2.2 The CRA must have the tools to be able to simulate an ATS ground station to the extent of exercising all combinations and ranges of CPDLC uplinks and ADS reports. The CRA must also have access to airborne equipment. For the airborne side, a test bench is adequate; however, engineering simulators that can be connected to either the ARINC or SITA communication network can offer additional capability. In support of the data link audit analysis task, the CRA must have software that can decode data link service provider audit data and produce usable reports. Without these tools it is virtually impossible for a CRA to resolve problems or monitor system performance.

4.2.3 Coordination is also a large part of the CRA's job. In the pursuit of problem resolution, action item resolution, monitoring, and testing, many issues arise that require coordination among many stakeholders. The CRA has the primary responsibility to provide this coordination function as delegated by the interoperability team.

4.3 CRA Task and Resource Requirements Table

4.3.1 Following is a list of CRA tasks and associated resource requirements.

CRA Task	**Resource Requirement**
• Manage data confidentiality agreement with all FIT members who provide problem reports	Legal services, technical expertise

• Develop and administer problem report process
  • de-identify all reports
  • enter de-identified reports into a data base
  • keep the identified reports for processing
  • request audit data from data link service providers
  • assign responsibility for problem resolution where possible
  • analyze the data
• Identify trends
	Problem reporting data base, ATS audit decode capability, airborne test bench as a minimum, simulator highly recommended, ATS simulation capability (CPDLC and ADS)

• Schedule, coordinate procedures testing	Airborne test bench as a minimum, simulator capability highly recommended, ATS simulation capability (CPDLC and ADS), ATS audit decode and report capability, technical expertise, operational expertise
• Administer and monitor an informal end-to-end configuration process.	Technical expertise
• Develop (as recommendations) new end-to-end system performance requirements.	Technical expertise, operational expertise
• Receive, decode, and process monthly end-to-end system performance reports from the air traffic service providers	Database tools, technical expertise
• Coordinate and test the implementation of proposed benefit enhancing procedures resulting from ATS data link systems for a given region (i.e. Dynamic Airborne Route Planning and or User Preferred Routes)	Technical expertise, operational expertise

5. Standards for Establishment and Operation of an ATS Data Link FIT and CRA

5.1 Recognizing the safety oversight responsibilities necessary to support the implementation and continued safe use of ATS data link systems, the following standards apply to any organization intending to fill the role of an FIT:

a) the organization must receive authority to act as an FIT as the result of a decision by a State, a group of States or a regional planning group, or by regional agreement;

b) the organization acting as an FIT should appoint a CRA the has the required tools and personnel with the technical skills and experience to carry out the following CRA functions:

1. develop and administer problem report process;

2. de-identify all reports;

3. enter de-identified reports into a database;

4. keep the identified reports for processing;

5. request audit data from data link service providers;

6. assign responsibility for problem resolution where possible;

7. analyze the data;

8. receive, decode, and process monthly end-to-end system performance reports from the air traffic service providers;

9. coordinate and test the implementation of proposed benefit enhancing procedures resulting from ATS data link systems for a given region;

10. administer and monitor an informal end-to-end configuration process;

11. manage data confidentiality agreements with all RMA members who provide problem reports, and

12. identify trends.

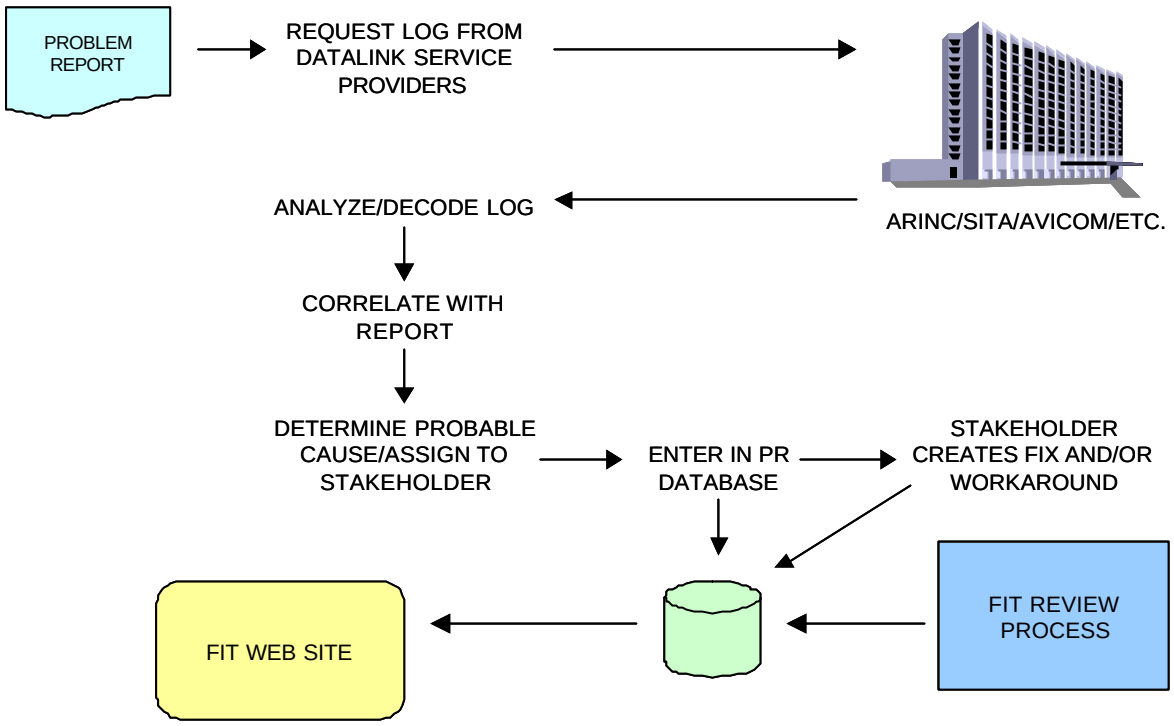
c) the FIT should ensure that the CRA is adequately funded to carry out their required functions.

6. Working Principles Common to all Interoperability Team Agencies

6.1 As stated, the intent of this guidance material is to introduce a common set of working principles for FITs. These principles have been agreed as the result of the combined experience of the North Atlantic FANS Implementation Group, South Pacific FANS Interoperability Team, Pacific FANS Interoperability Team, the FANS Action Team for the Bay of Bengal, and the ATN implementation in Maastricht ACC.

6.2 Problem Identification and Resolution

6.2.1 The problem identification and resolution process, as it applies to an individual problem, consists of a data collection phase, followed by problem analysis and coordination with affected parties to secure a resolution, and interim procedures to mitigate the problem in some instances. This is shown in the diagram below.



6.2.2 The problem identification task begins with receipt of a report from a stakeholder, usually an operator, ATS provider or communication service provider. If the person reporting the problem has used the problem reporting form provided in the appropriate regional manual, then data collection can begin. If not, additional data may have to be requested from the person reporting the problem.

6.2.3 The data collection phase consists of obtaining message logs from the appropriate parties (which will depend on which service providers were being used and operator service contracts). Today, this usually means obtaining logs for the appropriate period of time from ARINC and SITA (occasionally other service providers, such as AVICOM and AEROTHAI will be involved), but in future, with ATN development, additional providers (which should comply with EUROCAE ED-111), will become involved and airborne recordings should become available (as per EUROCAE ED-112). Usually, a log for a few hours before and after the event that was reported will suffice, but once the analysis has begun, it is sometimes necessary to request additional data, (sometimes for several days prior to the event if the problem appears to be an on-going one).

6.2.4 Additionally, some airplane specific recordings may be available that may assist in the data analysis task. These are not always requested initially as (doing so would be an unacceptable imposition on the operators), but may occur when the nature of the problem has been clarified enough to indicate the line of investigation that needs to be pursued. These additional records include:

- aircraft maintenance system logs;
- Built In Test Equipment data dumps for some airplane systems; and
- SATCOM activity logs.

6.2.5 Logs and printouts from the flight crew and recordings/logs from the ATS provider (s) involved in the problem may also be necessary. It is important that the organization collecting data for the analysis task requests all this data in a timely matter, as much of it is subject to limited retention.

6.2.6 Once the data has been collected, the analysis can begin. For this, it is necessary to be able to decode all the message types involved. Obviously, a tool that can decode all the ATS data link messages of the type used in that region is necessary. These tools would include:

- AFN (ARINC 622), ADS and CPDLC (RTCA DO-258/EUROCAE ED-100) in a region operating FANS-1/A;
- Context Management, ADS and CPDLC applications ICAO Doc 9705 and RTCA DO-280/ED-110) in a region using ATN; and
- FIS or ARINC 623 messages used in the region.

6.2.7 Once the messages have been decoded, the analysis requires a thorough understanding of the complete message traffic, including:

- media management messages;
- relationship of ground-ground and air-ground traffic; and
- message envelope schemes used by the particular data link technology (ACARS, ATN, etc).

6.2.8 It is also important for the analyst to have a good understanding in how the aircraft systems operate and interact to provide the ATS data ink functions, as many of the reported problems are airplane system problems.

6.2.9 All this information will enable the analyst to determine a probable cause by working back from the area where the problem was noticed to where it began. In some cases, this may entail manual decoding of parts of messages based on the appropriate standard to identify particular encoding errors. It may also require lab testing using the airborne equipment (and sometimes the ground networks) to reliably assign the problem to a particular cause.

6.2.10 Once the problem has been identified, then the task of coordination with affected parties begins. The stakeholder who is assigned responsibility for fixing the problem must be contacted, and a corrective action plan agreed.

6.2.11 This information (the problem description, the results of the analysis, and the plan for corrective action) is then entered in a database covering data link problems, both in a complete form to allow continued analysis and monitoring of the corrective action, as well as in a de-identified form for the information of other stakeholders. These de-identified summaries are reported at the appropriate regional management forum.

6.2.12 The CRA’s responsibility does not end with determining the cause of the problem and identifying a fix. As part of that activity, procedural methods to mitigate the problem may have to be developed while the solution is being coordinated (software updates to a fleet may take a considerable period before all aircraft have the fix).

REPORT OF THE SEACG/11 MEETING

Agenda Item 1: Adoption of Provisional Agenda

1.1 The meeting adopted the following agenda as the Agenda for the meeting:

Agenda Item 1: Adoption of Agenda

Agenda Item 2: Review status of recommended actions as agreed at the SEACG/10 and SCS/TF/8 Meetings

Agenda Item 3: Review current operations across South East Asia and identify problem areas

Agenda Item 4: Implementation of the new CNS/ATM systems in the Region

Agenda Item 5: Develop a coordinated plan for implementation of actions agreed by the meeting

Agenda Item 6: Any other business

Agenda Item 7: Date and venue for the SEACG/12 meeting

Agenda Item 2: Review status of recommended actions as agreed at the SEACG/10 and SCS/TF/8 Meetings

Review of Action Items from SEACG/10

2.1 The meeting reviewed and updated the Action Agreed Items arising from the SEACG/10 meeting held on 18-22 March 2002. The meeting closed 11 of the 15 Action Agreed Items. The results of the review were as follows:

2.1.1 **Action Agreed No. 1 (ATS) - China CNS/ATM Routes. China (LONG TERM)**

Status: Closed

The meeting was updated on the status of the polar route network on the basis of the information that was available amongst participants. The meeting agreed that these issues were being managed by the China, Mongolia, Russia and IATA (CMRI) meeting and had been discussed at CMRI/4 in March 2003.

2.1.2 **Action Agreed No. 2 (ATS) - Search and Rescue Exercise and Seminar. ICAO (LONG TERM)**

Status: Closed

The meeting was advised that during the Hong Kong, China annual SAREX in November 2003, an ICAO two day seminar was held in conjunction with the SAREX. The Secretariat complimented Hong Kong, China on the quality of the event and in particular on the conduct of the SAREX.

The meeting was advised that the Regional Office was coordinating with India to host an ICAO Seminar/SAREX for the Bay of Bengal area in November 2004. All States in the Asia/Pacific Region would be invited to attend.

2.1.3 **Action Agreed No. 3 (ATS) – Implementation of RNP 10. All States (LONG TERM)**

Status: Open

The meeting was updated on the status of RNP implementation in the region and additional RNP 10 routes were under consideration. The action item would be expanded to include RNP 4 as future implementation should be examined.

2.1.4 **Action Agreed No. 4 (ATS) – Radar Monitoring in the area of the Southern limit of South China Sea Area. Indonesia/Singapore (LONG TERM)**

Status: Closed

Indonesia and Singapore reported that attempts to display radar data from Indonesian in Singapore had been frustrated by technical problems and had ultimately been unsuccessful. The two States considered that there was no further value in attempting to pursue this option, particularly as it was expected that ADS-B coverage of the area would be available in Indonesia from the 2nd quarter of 2005**.** Indonesia would consider making the ADS-B data from the Natunas Island site available to Singapore. IATA requested that in order to provide the maximum lead time for operators to train and equip, advice on equipment upgrades like ADS-B be published by way of State AIP/AICs as early as possible to alert operators of new operational requirements. The meeting agreed that a new action item would need to be opened on ADS-B implementation, and the original action item was no longer necessary.

2.1.5 **Action Agreed No. 5 (ATS) – Proposal to Establish Additional ATS Routes for Hong Kong/Jakarta City Pair. China/Hong Kong China/Indonesia/Malaysia/Philippines/ Singapore/ Viet Nam/ IATA (MID TERM)**

Status: Open

This item was considered by this meeting and the outcome recorded in this report.

2.1.6 **Action Agreed No. 6 (ATS) – Proposal to Establish Additional ATS Routes for Brunei-Middle East/Europe Flights. Brunei Darussalam/Indonesia/Malaysia/ Singapore/ Thailand/Viet Nam/ IATA (MID TERM)**

That, Brunei Darussalam discusses the suggested options for shorter routes with Royal Brunei Airlines and advises States, ICAO and IATA on the outcome. IATA should work with these States to arrive at a viable solution.

Status: Open

Brunei Darussalam was not represented at the meeting. Therefore, no update was available and the issue is carried forward. The Regional Office would coordinate with Brunei to obtain an update on their position.

2.1.7 **Action Agreed No. 7 (ATS) – Establish Parallel Route into/out of Kuala Lumpur. Malaysia (MID TERM)**

Status: Closed

Malaysia and Singapore reported that this issue had been resolved as a result of the implementation of new airway Y334 and an extension to airway L625 to provide an

alternative routing.

2.1.8 **Action Agreed No. 8 (ATS) – Deletion of Requirements for A205 and G580. Brunei Darussalam/Malaysia (MID TERM)**

That, Brunei Darussalam and Malaysia co-ordinate with ICAO for a necessary amendment to the Asia/Pacific ANP to delete the requirements for A205 and G580 from the ANP.

Status: Open

Brunei Darussalam was not represented at the meeting. Malaysia reported that they would prefer to retain A205, and that the portion of G580 between BRU and VJN was replaced by B348. The Regional Office would coordinate with Brunei to progress this matter.

2.1.9 **Action Agreed No. 9 (ATS) – Establish RNAV Route to Replace B584 (Kota Kinabalu-VINIK). Malaysia (MID TERM)**

Status: Closed

B584 has been replaced by RNP 10 route M522.

2.1.10 **Action Agreed No. 10 (ATS) – Implementation of Radar Handover Procedures. All States (LONG TERM)**

That, States identify areas where radar handover procedures can be applied at common FIR boundary, and implement the procedures.

Status: Open

The meeting was updated on progress with this issue. Many States had introduced radar handover procedures since this issued was raised. Some States identified areas where progress was still to be made and agreed to move towards radar handover procedures as soon as possible.

2.1.11 **Action Agreed No. 11 (ATS) – Dissemination of Aeronautical Information. All States (LONG TERM)**

Status: Closed

The meeting was reminded that timelines for the dissemination of changes to AIS were already included in ICAO documentation. The meeting agreed that the primary documentation covered this issue and that there was no requirement to carry a separate action item. The meeting was advised that the AIS Task Force convened under APANPIRG/14 would hold its first meeting in September/October 2004, and would be addressing AIS matters.

2.1.12 **Action Agreed No. 12 (ATS/COM) – Radar Data Sharing. All States (LONG TERM)**

Status: Closed

The meeting was advised that agreement had been reached with EUROCONTROL to adopt their ASTERIX protocol for radar data in the region to facilitate the exchange of radar data between States. ICAO Regional Office has published suitable guidance documentation to States.

2.1.13 **Action Agreed No. 13 (COM) – Upgrading AFTN circuits. Brunei/Singapore/Japan (MID TERM)**

Status: Closed

The meeting was advised that AFTN upgrade works had been completed with:

- Brunei/Singapore circuit upgraded to 4800 bps from 75 baud, and
- Singapore/Tokyo circuit upgraded to 9600 bps from 1200 bps.

2.1.14 **Action Agreed No. 14 (COM) – Improvement in quality of the Ho-Chi-Minh/ Kuala Lumpur ATS direct speech circuit. Malaysia/Viet Nam (MID TERM)**

Status: Closed

The meeting was advised that the direct speech circuit between Ho Chi Minh and Kuala Lumpur was routed via a hub station in Bangkok. Hub capacity had been improved which had led to an improvement in quality. Malaysia and Viet Nam both confirmed that there were no further problems with the quality of the direct speech circuit.

2.1.15 **Action Agreed No. 15 –Invitation to SEACG for Other States Relative to with AR-9 ICAO (MID TERM)**

Status: Closed

ICAO has made appropriate arrangements to invite other States relative to AR-9 to future meetings of SEACG.

Review of Action Items from SCS/TF/8

2.2 The South China Sea Task Force, at it's eighth meeting (2-3 December, 2003), recognized that the SCS/TF had completed its primary task to implement and review post implementation of the SCS ATS route structure. As one year had passed since implementation, it was considered appropriate by the SCS/TF/8 meeting to terminate the Task Force and for all outstanding tasks to be undertaken by the SEACG meetings. The SEACG/11 meeting reviewed and updated the Action Agreed Items arising from the SCS/TF/8 meeting and closed 7 of the 11 Action Agreed Items. The results of the review were as follows:

2.2.1 **Action Agreed No. 1 (ATS) - Review weather deviation procedures in the South China Sea Area. SCS States (MID TERM)**

Status: Closed

An amendment to Doc 7030 has been approved incorporating weather deviation procedures. Hong Kong, China stated that there was still room for improvement of the flight level assignment being used to manage weather deviation procedures which reduced by half the number of flight levels available and this could lead to capacity problems. Hong Kong, China considers that introducing the single alternate FLOS to replace the current modified single alternate FLOS would assist.

2.2.2 **Action Agreed No. 2 (ATS) - Investigate improvements to flight operations on the Denpasar to Bangkok Routing. Indonesia/Singapore (MID TERM)**

Status: Closed

Indonesia and Singapore reported that this issue was no longer a problem. Improvements had been made by the introduction of RVSM with FL310 usable on N875 and modifications made to G464 (ARUPA- Denpasar).

2.2.3 **Action Agreed No. 3 (ATS) - Raising the upper limit of G334 from KIBOL to KAMIN Malaysia and Singapore. Malaysia/Singapore (MID TERM)**

Status: Closed

Singapore and Malaysia reported that they had communicated with operators to explain the difficulties involved with this proposal. Changing the level would have adverse impacts. Agreement was reached between those concerned to leave the level at FL280.

2.2.4 **Action Agreed No. 4 (ATS) - Review the airspace arrangements for ATS routes and transfer of control in points in Viet Nam's airspace. Viet Nam/adjacent States/ICAO (MID TERM)**

Status: Open

That, Viet Nam and adjacent States concerned review and coordinate with ICAO on the airspace arrangements for ATS routes and transfer of control points to improve the efficiency of providing air traffic control services in the Ha Noi and Ho Chi Minh FIRs.

The meeting clarified that the main issue was in regard to weather deviation on L628 and Viet Nam requested that this matter required further consideration at the next meeting. The meeting agreed to keep this item open.

2.2.5 **Action Agreed No. 5 (ATS) - Improvement to the routing between Hong Kong to Jakarta. China/Indonesia/Philippines/Malaysia/Singapore/Viet Nam/IATA (IMMEDIATE)**

Status: Open

This item is duplicated as Action Agreed No. 5 from the SEACG/10 list. The item was subject to a separate working paper (WP/10) and sub group activity during SEACG/11. The outcomes are recorded elsewhere in this report.

2.2.6 **Action Agreed No. 6 (ATS) - Re-alignment of RNP 10 ATS routes N892 and L625. China/Philippines/Singapore/Viet Nam/IATA (MID TERM)**

Status: Open

Viet Nam reported that the realignment proposal would take these routes outside Radar and VHF coverage. The introduction of Viet Nam ADS/CPDLC was expected in 2007 and would facilitate a route realignment at that time. No action could be taken at this time.

2.2.7 **Action Agreed No. 7 (ATS) - China Danger Areas affecting A1 and P901. China/Viet Nam/Hong Kong/China (MID TERM)**

That, in order to allow all aircraft to use A1/P901 H24:

a) China investigates the possibility of amending the operating hours of D155, D156, D157 and D158; or,

b) Viet Nam, China and Hong Kong, China take steps to realign P901 to be clear of the Danger Areas and realign A1 so as to be below P901.

Status: Open

China reported that they were considering realignment of A1 and P901 to avoid the danger areas and the routes to be available 24 hours.

2.2.8 **Action Agreed No. 8 (ATS) - Enhancement of service to international flights on ATS route A202 between Bangkok and Hong Kong. China/Hong Kong China (MID TERM)**

Status: Closed

Hong Kong, China described the arrangements contained in the Hong Kong AIP section ENR 1.1.3, paragraph 3 et al. Hong Kong, China reported the difficulties associated with the use of A202, including the transition to metric flight levels, and pointed out that an alternate routing through the Hong Kong FIR to Taibei FIR was available via P901 with a distance penalty of only about 2 NM.

China shared Hong Kong China's concern about the transitions to metric levels but indicated that a change was unlikely to occur. The meeting agreed that the transition between the two flight level systems was complex, particularly in the circumstances where an aircraft was operationally limited to FL410. The metric equivalent cruising level was FL412 and, as some aircraft could not operationally accept this level, they had to descend with consequences on the traffic pattern beneath. The meeting decided to retain a component of the previous Action Agreed as a separate action item.

Status: Open New Action Agreed

China/Hong Kong China (MID TERM)

Consideration should be given to introducing an alternate arrangement to the metric cruising level system for operations on A202 to facilitate flights with ceiling limitations.

2.2.9 **Action Agreed No. 9 (ATS) - Development of contingency arrangements for routing North of the Himalayas in the event that military activities leads to closures of airspace in the Middle East Region. Cambodia/China/Lao PDR/Viet Nam/IATA/ICAO (IMMEDIATE)**

Status: Closed

The Secretariat advised that the Contingency Routing Scheme for Asia/Middle East/Europe (CRAME II) plan had been completed and adopted by ICAO. The Contingency Plan is available for use and involves contingency routings via Afghanistan, Iran and North Africa. Routings north of the Himalayas were unlikely to be available in the foreseeable future.

2.2.10 **Action Agreed No. 10 (ATS) – Radar Separation on A202. Hong Kong, China, China, Vietnam, Lao PDR, Thailand (MID-TERM)**

That, States concerned work together to introduce radar separation procedures on ATS route A202 in a staged approach, initially commencing with 40NM spacing between aircraft at the same altitude.

Status: Open

Some work has been completed on this issue including the signing of Letter of Agreements between adjacent States allowing use of 40 NM. Thailand is completing some training issues and expects to commence using 40 NM from 1 July 2004. Affected States agreed that this was the first stage of a process to reduce spacing between aircraft towards the minimum radar separation and agreed reduction below 40 NM would be considered as soon as practicable. Hong Kong advised that the increased capacity on A202 as a result of the 40 NM separation would exacerbate the problems associated with A202 (as described in Action Agreed No. 8 above), and made it even more important that alternate routing via P901 was utilised.

2.2.11 **Action Agreed No. 11 (COM) - Investigation of missing Flight Plan Messages. China, Malaysia, Singapore and IATA (IMMEDIATE)**

Status: Closed

The RO/CNS advised the meeting that ICAO had completed an investigation into the problem of missing flight plan messages. The investigation found that one centre had been experiencing problems with ATN software. AFTN rerouting had been put in place and the problem had not re-occurred.

2.3 The meeting agreed to adopt a table format presentation for the meeting's action items and to include them as an appendix to the report of the meeting for ease of reference.

Agenda Item 3: Review current operations across South-East Asia and identify problem areas

Review of the APANPIRG List of Air Navigation Deficiencies in the ATS/AIS/SAR Fields

3.1 The meeting was provided with the List of Deficiencies in Air Navigation in the ATS/AIS/SAR Fields in the Asia Pacific Region from the APANPIRG/14 report, and States were invited to review the list and notify the Regional Office by official correspondence of any amendments, corrections or deletions to the listing.

3.2 The meeting was briefed regarding the outcomes of a number of ICAO fora relating to the management of deficiencies in the Air Navigation Field. The 11th Air Navigation Conference (AN-Conf/11) recalled efforts by ICAO, PIRGs and States in pursuing the elimination of deficiencies in the air navigation fields and the implementation of all regional air navigation plans to further improve the existing levels of safety. The Conference noted that many deficiencies had continued to persist for a number of years, thus causing concern. Furthermore, States should increase their efforts to overcome the delay in mitigating the air navigation deficiencies identified by the respective PIRG and resolve cases of non-implementation of regional plans.

3.3 The 33rd Session of the ICAO Assembly (September/October 2001), through Resolution A33-16, had urged States to apply the political will to take the remedial action identified by Universal Safety Oversight Audit Programme (USOAP) to correct the deficiencies identified in the regional planning process and related activities, and to promulgate the necessary regulations to implement the safety systems developed under the Global Aviation Safety Plan (GASP).

3.4 The meeting noted that the question of deficiencies was also the subject of the Deficiency Review Task Force held on 13-14 May 2004. The mechanisms in place to report and follow-up on deficiencies was reviewed and an Asia/Pacific supplement to the Universal Methodology for the Identification, Assessment and Reporting of Air Navigation Deficiencies had been developed to assist APANPIRG and States better manage the elimination of deficiencies. The States present were urged to bring this matter to the attention of their Administrations.

Dissolution of the Bangkok AOR

3.5 Cambodia informed the meeting of progress made to resume the air traffic services for the Bangkok Area of Responsibility (AOR) operated by AEROTHAI on behalf of the State Secretariat of Civil Aviation of Cambodia (SSCA). The establishment of the Bangkok AOR had been necessary due to Cambodia's lack of ATS communication and surveillance capability to provide the air traffic services for this airspace. In order to ensure suitable ATS services in this area, an agreement was reached between Cambodia and Thailand under which AEROTHAI provided the ATS services.

3.6 Cambodia reported that since the end of 2001, they have installed Monopulse SSR (MSSR), upgraded all ATC related VHF radio stations and commissioned the Phnom Penh Area Control Center (ACC). The Bangkok AOR was now under the coverage of the new Cambodian MSSR and ACC VHF radio communication.

3.7 As a result of the improvement to ATS facilities in Cambodia, the SSCA was able to resume the ATS services for the Bangkok AOR. In this regard, Cambodia and Thailand have reached agreement that from the 8th of July 2004 responsibility for the provision of ATS services in the Bangkok AOR will be returned to Cambodia. Cambodia intends to integrate the Bangkok AOR with the Phnom Penh FIR and resume the ATS responsibility over this airspace.

3.8 Cambodia also advised the meeting that, in accordance with the current government policies, Sihanoukville Airport, (located at 1137N, 10300E) will be upgraded to a regional airport. To meet expected future air traffic demands, Sihanoukville Terminal Area (TMA) will be established for the provision of ATS.

3.9 In light of the resumption of ATS by Cambodia for the Bangkok AOR, IATA expressed concern at the configuration of the narrow southern wedge of the Bangkok AOR, which with the addition of another ATS Provider, there would be three ACCs, Bangkok, Ho Chi Minh and Phnom Penh involved in the operation of the airspace. This would result in more complex communication and coordination requirements especially when aircraft deviated due to weather. For example, aircraft diverting west from N891 would need to be coordinated by Ho Chi Minh with both Phnom Penh and Bangkok. IATA suggested that the FIR boundaries be realigned to remove the airspace complexity, or that ATS procedures be arranged so that either Bangkok or Ho Chi Minh took responsibility for this airspace.

3.10 The meeting recognized the difficulties involved in changing FIR boundaries and suggested that a practical alternative would be for Phnom Penh ACC to delegate the ATS responsibility to another ACC under an operational Letter of Agreement. This would address the immediate operational problems and lead to more efficient air traffic management.

3.11 The three States involved, Cambodia, Thailand and Viet Nam discussed the matter and agreed that it would be preferred to have Viet Nam delegated responsibility for ATS for the small portion of the AOR in question under the terms of a combined ATS operational Letter of Agreement between the three States. This arrangement would be progressed by the three States concerned following this meeting to finalize the details, with the intention of completing the Letters of Agreement and other arrangements in time to proceed with the original implementation date of 8 July 2004. The meeting expressed appreciation to Cambodia and the spirit of co-operation between the States which resulted in an effective operational solution being quickly agreed.

Updating the SCS routes safety assessment

3.12 The meeting was informed by the Secretariat of the safety assessment arrangements that had been put in place for the implementation of RNP 10 operations on the South China Sea route system on 1 November 2001. A traffic sample based on the existing route structure had been utilized, which was taken prior to implementation. At the request of South China Sea Implementation Task Force, assistance was sought from Airservices Australia to conduct the pre-implementation safety assessment. This was carried out and the results showed that the TLS of 5×10^{-9} fatal accidents per flight hour had been met. A copy of the safety assessment is attached at **Appendix A**.

3.13 The meeting, on reviewing the arrangements for follow-up action on the safety assessment, noted that as the original safety assessment had used traffic data based on the previous route structure, agreed that there was a need to update the assessment using present traffic data. Further, the six parallel routes are spaced at 60 NM and the safety assessment was performed on the basis of 50 NM. In this regard, IATA requested that States give consideration to reducing the minimum separation that may be applied to 50 NM as this would afford greater flexibility and facilitate deviations due to weather and other contingencies. In this regard, the meeting was advised by the Secretariat that the MID/ASIA Regional Supplementary Procedures (Doc 7030) would need to be amended to permit the use of 50 NM as a regional agreement was required by all States concerned. States were advised to submit an amendment proposal to include the FIRs concerned to the ATM/AIS/SAR/SG/14 meeting to be held on 28 June-2 July 2004 or to APANPIRG/15 on 23-27 August 2004.

3.14 The Secretariat advised the meeting that at the RASMAG/1 meeting (26-30 April 2004), it was agreed to establish safety monitoring groups to undertake the safety management programmes for the application of RNP, data link services and related separation minima. In regard to the SCS area, apart from MAAR who provides the RMA services for RVSM, RASMAG/1 identified a need for a safety monitoring group to be responsible to carry out the safety assessment activities for the other separation minima being used with RNP 10 and later when ADS and CPDLC were introduced. Further, RASMAG/1 had recommended that APANPIRG/15 consider setting regional Safety Management Agencies (SMAs) to potentially undertake all safety activities within the area of responsibility of the agency.

3.15 Thailand advised the meeting that discussions were under way between AEROTHAI and Airservices Australia on the possibility of establishing a joint SMA to provide safety assessments services in the Asia Region. It was anticipated that the RASMAG/2 meeting on 4-8 October 2004 would be informed of the outcome of these discussions

3.16 The meeting agreed that a traffic sample data collection was required to update the SCS routes safety assessment to apply to 50 NM lateral route spacing, and requested States concerned to provide the data for the month of July 2004, and submit this to the Regional Office by 1 September 2004 for consideration by RASMAG/2.

Update on airspace safety monitoring activities for RVSM Implementation in the SCS/WPAC and Bay of Bengal areas

3.17 The meeting reviewed the action taken by the ICAO RVSM Task Force and regional monitoring agencies (RMAs) in regard to airspace safety monitoring activities for RVSM implementation and follow-up in the Western Pacific (WPAC) and South China Sea (SCS) and the Bay of Bengal and Beyond areas

3.18 The RVSM/TF was responsible for RVSM implementation planning and follow-up for WPAC/SCS RVSM implementation which was carried out in two phases: Phase 1on 21 February 2002 and Phase 2 on October 2002, and for the Bay of Bengal and Beyond area implementation was on 27 November 2003. The airspace safety assessments and monitoring activities were carried out by the respective regional monitoring agencies: the Asia Pacific Approvals and Aircraft Registry Monitoring Organization (APARMO) operated by the United States Federal Aviation Administration (FAA) and the Monitoring Agency for the Asia Region (MAAR) operated by the Aeronautical Radio of Thailand. (AEROTHAI), which took over the RMA responsibility for the Asia Region from APARMO on 2 September 2003.

Review of safety assessment for implementation and post implementation of RVSM in the WPAC/SCS

3.19 The APARMO conducted an assessment of the safety associated with the planned RVSM implementation on 21 February 2002 in the WPAC/SCS area. The safety goal to be satisfied when implementing the RVSM was a Target Level of Safety (TLS) of 5×10^{-9} fatal accidents per flight hour. The meeting noted the two-step approach to applying the TLS when evaluating the acceptability of the collision risk estimated to pertain when the RVSM was implemented:

a) the estimated collision risk attributable to aircraft height keeping performance (technical risk) should be less than 2.5×10^{-9} fatal accidents per flight hour due to the loss of correctly established vertical separation of 1,000 ft: and

b) the estimated collision risk due to all causes should be less than 5×10^{-9} fatal accidents per flight hour.

3.20 The technical and operational risk assessed by APARMO, i.e. the risk due to all causes was equal to 1.2×10^{-9} fatal accidents per flight hour, which was well below the TLS value.

3.21 At the one year review meeting carried out by RVSM/TF/18 on 30 June to 4 July 2004, it was recorded that MAAR had taken over full responsibility as the Asia Region RMA from APARMO on 2 September 2003 and subsequently APARMO was renamed PARMO. The RVSM/TF had noted that there had been an increase in large height deviations (LHDs) due to operational errors (e.g. ATC transfer of control coordination) in a few FIRs. Although the TLS had not been infringed, the meeting agreed that the States concerned in the Asia Region should review current ATC operations and put measures in place to reduce such operational errors. The meeting was advised that States were kept informed of the results of MAAR's safety activities.

3.22 A review was carried out of the total risk estimated for Phase I, II, and the combined Phase I and II of the RVSM implementation in WPAC/SCS. The total risk included the technical risk due to aircraft height-keeping systems and operational risk arising from large height deviations, which had occurred in this region. According to the risk estimates calculated, the technical risk for Phase I, Phase II, and the combined Phase I and II RVSM implementations was 4.18×10^{-10}, 9.96×10^{-10}, and 5.08×10^{-10}, respectively. All of these estimates satisfy the agreed TLS value of no more than 2.5×10^{-9} fatal accidents per flight hour due to the loss of a correctly established vertical separation standard of 1,000 ft.

3.23 It was recalled that the RVSM/TF/16 discussed the need to refine the safety assessment carried out for WPAC/SCS since the assessment did not factor in the use of the modified single alternate FLOS for the Phase II RVSM, especially for the flight level utilization on ATS routes A1/P901. Therefore, the collision risk estimates for the Phase II RVSM implementation was overly conservative. In addition, when the modified single FLOS was taken into account the technical risk for the Phase II RVSM implementation would be in the order of half the value reported previously. In this regard, the modifications made to the basic CRM took into account the use of the modified single alternate FLOS on ATS routes A1/901 in the WPAC/SCS airspace.

3.24 According to the refinement of the collision risk estimates, the total risk attributed to all causes was 1.35×10^{-9}. The total risk attributed to all causes was 1.92×10^{-9}. Although the risk estimates using the modified collision risk model (CRM) recommended that it was and had been safe for RVSM to be implemented in the WPAC/SCS airspace, there were a number of LHDs that occurred after the implementation in October 2002 that greatly influenced operational risks. Hence, careful monitoring of the LHD occurrences in WPAC/SCS was very important and required. MAAR advised that there had been an increase in LSDs in the transition areas involving the modified single alternate and the single alternate FLOS.

3.25 The meeting noted the safety assessment work carried out for RVSM implementation and that States needed to continue to pay close attention to monitoring LHDs and to report these to MAAR on a monthly basis, including NIL.

Harmonization of the modified single alternate FLOS applicable in the SCS area with the single alternate FLOS

3.26 The meeting recalled that at the RVSM/TF/16 meeting (September 2002), discussions were held regarding harmonization of the modified single alternate FLOS with the single alternate FLOS that had been implemented by States outside of the SCS area. It was considered that ultimately a single alternate flight level orientation scheme should be adopted, and studies made in preparation for any transition plan to introduce a single alternate FLOS.

3.27 The RVSM/TF/18 meeting reviewed the modified single alternate FLOS that was utilized for RVSM operations in the WPAC/SCS areas. Some States proposed that the single alternate should be used in order to harmonize with the FLOS in adjacent areas, so that seamless RVSM operations between the Pacific, Asia, Middle East and Europe could be achieved. Recognizing that the modified single alternate FLOS had been operating well since RVSM implementation in February 2002 and that safety and operational efficiency had been enhanced, the meeting agreed that a detailed study should be conducted to support any change to the FLOS. This should include the necessary safety assessments relating to RVSM operations. The concerned States, IATA, IFALPA and IFATCA concurred with the need for the detailed study to be completed in order for any change to the FLOS to be done. The meeting decided to continue with the modified single alternate FLOS for the WPAC/SCS areas, with a view to review the FLOS when the study by States concerned was completed.

3.28 The meeting noted that action to examine changing the modified single alternate to the single alternate had not yet taken place and the studies called for by RVSM/TF/18 had not been carried out by the States concerned. The Secretary informed the meeting that a RVSM Special Coordination Meeting (SCM) to examine the harmonization of the FLOS had been scheduled for 20-24 September 2004. It was intended to

invite all States responsible for the FIRs concerned, members of the RVSM/TF and international organizations to this meeting. Therefore, to assist the SCM review the issues, the meeting agreed that, States should complete their studies to consider a transition plan to introduce a single alternate FLOS for the South China Sea area. The studies should include a risk analysis of the impact of changing from the modified single alternate to the single alternate FLOS. In addition the RMA responsible, MAAR should conduct a safety assessment of both FLOSs and compare the results to determine the effect on the TLS. In order for MAAR to undertake the safety assessments the meeting agreed that an up to date traffic sample should be taken. In view of the TSD to be taken for the RNP 10 safety assessment, this should be expanded to include the necessary data for RVSM. A draft traffic sample data template is provided in **Appendix B**.

3.29 Thailand presented information related to the difficulties being experienced by air traffic management in the Bangkok and adjacent FIRs, regarding the operation of the modified single alternate and single alternate RVSM FLOSs in adjacent airspace.

3.30 Recognizing the successful implementation of RVSM in the region since February 2002, there were some operational difficulties being experienced within the transition areas between the two different FLOSs, which has resulted in increased controller workload. Also the operation of two FLOSs interrupts a seamless flow of traffic across the regions. In this regard, the Bangkok FIR was located in the overlapping area between the WPAC/SCS and the Bay of Bengal airspace where the modified single alternate and the single alternate operate respectively.

3.31 Bangkok ACC has been carrying out the transition task for a period of time as agreed in the RVSM Implementation Plan. However, Bangkok ACC supports the use of a single alternate FLOS throughout the region, which was also consistent with global application and the operational concept of harmonizing RVSM operations.

3.32 To overcome the operational difficulties being experienced in the Bangkok FIR transition areas, Bangkok suggested that a new flight level allocation scheme should be introduced based on the single alternate FLOS. An example of a possible flight level assignment was provided for consideration.

3.33 The meeting recognized that the issues raised by Thailand required further detailed consideration which was beyond the resources of this meeting to address. Accordingly, this would be referred to the RVSM SCM scheduled on 20-24 September 2004. The Secretariat encouraged States to complete their studies on changing the FLOS from the modified single alternate to the single alternate for the SCS route structure in good time for the matter to be addressed at the RVSM SCM in September. The meeting was reminded that safety assessments would need to be carried out to support any changes to the FLOS, and the TSD to be carried out for July 2004 would be required to obtain that data to undertake these assessments.

3.34 IATA emphasized that in considering changes to the present mode of operation on the SCS route system, a thorough technical and safety analysis would need to be carried out, and any changes should result in at least the present safety level, operational efficiency and regularity was being maintained or enhanced. IATA also commented that any change to the FLOS requires suitable arrangements to be made for crossing traffic.

3.35 Singapore expressed concern that the introduction of the single alternate FLOS proposed by Thailand would add complexity to air traffic management of the route system and the crossing routes in particular, and the flight level arrangements would require thorough examination.

3.36 Hong Kong, China advised the meeting that they supported Thailand's position to change to the single alternate FLOS but recognized that the flight level assignment for the SCS routes would require more detailed examination. Accordingly, they requested that States concerned carry out simulations of the effect of changing the FLOS on the traffic flow. The meeting endorsed this request and expected that the RVSM SCM would resolve this matter.

Lateral offset developments

3.37 The meeting was reminded of the guidelines provided by ICAO on the use of lateral offsets as a safety measure to reduce the risk of collision in the event of loss of vertical separation. Guidelines were circulated under State letter AN 13/11.6-00/96 dated 3 November 2000, and allowed for the use of a 1 NM offset in cases where a 50 NM lateral separation was being applied using RNP 10 in a non-radar environment. As this was the most stringent case, and in the interest of global harmonization, it was suggested that this should be the standard offset used. Also, it was necessary to ensure that the application of offsets to reduce the risk of collision as a result of loss of vertical separation would not unduly increase the risk of loss of lateral separation between aircraft on adjacent tracks. The 1 NM offset catered for this situation.

3.38 Subsequently, further guidance was developed by the Separation and Airspace Safety Panel (SASP), and the original guidelines were revised by State letter AN 13/11.6-02/21 dated 31 May 2002 to allow for the application of offset procedures up to 2 NM provided that a safety analysis for the particular airspace had shown that the proposed procedures would meet appropriate safety criteria.

3.39 It was noted that a 2 NM offset procedure (using 0, 1 and 2 NM offsets) had been introduced in the West Atlantic airspace and this incorporated the previous wake turbulence procedure but restricted to deviation right of track only (previously aircraft could deviate up to 2 NM left or right of track at pilot's discretion).

3.40 Under amendment proposal (APAC-S 00/4) to the MID/ASIA/PAC/RAC SUPPs (Doc 7030), on 4 March 2004 ICAO approved the use of the 1 NM offset procedure in specified FIRs in the Asia/Pacific Region as follows: Auckland Oceanic, Brisbane, Honiara, Melbourne, Nauru, New Zealand, Port Moresby Auckland Oceanic, Easter Island, Nadi and Tahiti.

3.41 SASP was continuing its work to provide global offsets procedures using the 2 NM procedure, and it was expected that the ICAO guidelines would be revised accordingly in the near term. In this regard, the meeting endorsed the safety benefit of introducing a global lateral offset procedure, and agreed that as soon as ICAO published the revised guidelines, States should adopt this procedure.

Improvement to the routing between Hong Kong/Jakarta and beyond

3.42 IATA requested that the meeting consider improving the SCS route structure for flights operating between Hong Kong and Jakarta. Since the introduction of the revised SCS routes on 1 November 2001, flights have suffered severe operational penalties of up to 30 minutes for a round trip. In addition to extra fuel costs, increased maintenance as well as flight crew limitations had resulted in losses for one airline of approximately US$ 4.6 million annually.

3.43 IATA proposed two possible options in the proposal: Option 1 envisages a single route to be used as a bi-directional route between Hong Kong and Jakarta; and Option 2 involves the use of two separate unidirectional routes.

3.44 The meeting considered the IATA proposal and after extensive discussions by the States concerned, agreed to Option 2, which used the north-bound track of Option 1 from Jakarta via the Manila FIR to Hong Kong, and a south-bound route on the western side of the South China Sea route structure. The north-bound route would require implementation of new route to join existing routes. The south-bound route mainly used existing routes. Details of the routes are provided in **Appendix C.**

3.45 In regard to the operating procedures the States agreed to the following operating requirements:

a) RVSM, RNP 10 and RNAV to be specified;

b) FL 310 and FL 350 north-bound available with no prior departure coordination (No-PDC), and all other levels subject to coordination. On the south-bound routes, existing procedures to apply;

c) traffic north-bound restricted to Hong Kong and destinations beyond in China via Hong Kong (i.e. traffic routing to Japan and Taibei are not permitted to use this route, as alternative routes were available);

d) the vertical lower limit of the north-bound route to be FL285;

e) a safety assessment of the routes to be carried out; and

f) a review to be conducted after 3 months.

3.46 The States agreed to prepare an AIP Supplement for the introduction of the route providing a two AIRAC cycle notification to users. An ANP amendment proposal would be prepared in coordination with the Regional Office and presented to APANPIRG/15. The meeting agreed that the Regional Office should coordinate with the States concerned on the implementation arrangements, and to determine an implementation date as soon as practicable.

3.47 IATA expressed its appreciation to the States concerned for their cooperation and expediency in agreeing to implement this route, which will be of major benefit to operators, especially in view of the recent significant increase in fuel costs. Also, the environmental benefits in reduced fuel consumption should be recognized.

No-PDC review

3.48 In regard to the use of No-PDC procedures, the meeting was requested by IATA to review this arrangement in light of advances in ATM automation and other means available to determine flight level allocation. The No-PDC arrangement that was introduced over 10 years ago to reduce controller workload during periods of busy traffic, had resulted in desired benefits, but in recent times, with ever increasing traffic, operators were of the view that the system had become too rigid and did not facilitate a flexible use of flight levels. This has led on occasions to unnecessary delays. In view of the advances in ATM automated systems, these should be used to greater effect and air traffic flow management arrangements put in place taking full advantage of these systems to maximize the use of available levels. With access to accurate and timely information on the progress of flights in the air and on the ground over a wide area of operations, a more comprehensive traffic picture could be gained to facilitate controllers' decision making on the allocation of levels and management of major traffic flows.

3.49 The meeting recognized that improvements could be made to the No-PDC practices and agreed that this subject would be included on the future agenda of this meeting.

Indonesian route developments

3.50 Indonesia informed the meeting that RNP 10 routes had been implemented in their FIRs in accordance with the EMARSSH project Phase I and Phase II, and the following routes had been established:

a) Phase I (between Australia and Singapore): N646, N752, L764, L895 and L511; and

b) Phase II (with the Bay of Bengal area): P570, M300, N563 and P574.

3.51 In its continuing implementation programme of restructuring airspace and routes within Indonesia FIR, seven new RNP 10 routes were proposed for implementation subject to agreement by other States concerned. The proposed target date for implementation would be published through an AIP supplement on the July "AIRAC Date cycle" with an effective date in service on 29 September 2004, except for implementation of M635/A576 and M522/B584, which would be postponed until after November 2004, following further discussion with Brunei Darussalam and Australia. Details of the routes are provided in **Appendix D**.

3.52 The meeting considered the Indonesian proposal to change existing routes and to add new routes in the Jakarta FIR and adjacent FIRs. IATA requested that further study of the proposal was required to consider the impact on flight operations. The meeting also requested that the other States concerned should coordinate with Indonesia and IATA, and agree on a proposal to amend the ANP. Indonesia would prepare an ANP amendment proposal to be coordinated with the Regional Office and submitted to APANPIRG/15.

Harmonization of the lower vertical limit of SCS RNP 10 airspace

3.53 Hong Kong, China brought to the attention of the meeting the variety of lower vertical limits which applied to the SCS RNP10 routes which varied between 8000 feet and FL270. In particular Hong Kong was concerned for flights requiring to operate on L642, M771 and P901. At present there was no provision for non-RNP 10 aircraft to operate across the RNP 10 route structure at acceptable operational levels.

3.54 Hong Kong proposed that a standard level should be applied to all these routes to the extent possible. The meeting recognized the existing lower limits of the RNP10 airways effectively precluded non-RNP10 aircraft from using the routes. As there were no suitable conventional/RNAV airways available for non-RNP10 aircraft to use, it was not possible for a non-RNP10 aircraft to flight plan on the above routes. Both airspace users and providers agreed that this situation should be improved if it did not compromise operations for the majority of airspace users. The meeting recognized that operators of less capable aircraft should make an effort to comply with the operational requirements established that benefit the majority of operators who have equipped their aircraft to take advantage of the benefits to be gained by using RNP 10, thereby allowing for reduced aircraft separation and increased airspace capacity.

3.55 The meeting agreed that only RNP10 aircraft could operate in the RNP10 route structure. Consequently, it would be necessary to provide for non-RNP10 aircraft to transit the SCS airspace whilst remaining clear of the RNP10 route structure. In addition, Hong Kong indicated that non-RNAV flights operating at the same level on P901/L642/M771 would not be laterally separated and at least 100 NM separation would be required with RNP 10 aircraft. Accordingly, ATS providers concerned would need to consider a flight level allocation scheme to facilitate the application of vertical separation between non-RNAV flights operating on adjacent routes.

3.56 The Secretariat advised the meeting of some of the safety assessment requirements for the RNP routes. The safety assessment that was undertaken for the SCS route structure only applies to RNP10 approved aircraft, therefore no other aircraft should be permitted into the airspace except under special circumstances. In this regard, operations would be approved as allowed for under the Convention on International Civil Aviation. i.e. State aircraft (used in military, police and custom services) and other special flights could be approved on a case by case basis such as humanitarian flights, search and rescue aircraft on

mission, and aircraft in emergency, subject to the application of non-RNP10 separation.

3.57 After an extensive discussion the meeting agreed that RNAV routes (non-RNP10) should be established under existing RNP10 routes. The upper limit should be set at FL285 wherever possible to allow RNAV aircraft to flight plan at FL280. The meeting agreed that these arrangements should be kept under review and any changes to the route arrangements, separation criteria or significant increases in traffic density, etc should be subject to further safety assessment.

3.58 Hong Kong, China agreed to prepare an AIP supplement for the Hong Kong AIP and to distribute the draft supplement to affected States and IATA for comment. States should adopt the same wording for their respective AIP supplements.

Agenda Item 4: Implementation of the new CNS/ATM systems in the Region

Duties, responsibilities and work programme of the Monitoring Agency for the Asia Region (MAAR)

4.1 MAAR presented to the meeting an outline of its duties, responsibilities and future works for 2004. Currently, the primary functions of MAAR were to undertake safety assessment and monitoring activities for the RVSM implementations in the Asia Region and report the outcomes to RASMAG. MAAR was coordinating with Airservices Australia to establish a safety management programme to support the needs of safety assurance in the Asia Region; this would include safety activities for RNP implementations. Details of the MAAR current and future responsibilities are included in **Appendix E.**

Agenda Item 5: Develop a coordinated plan for implementation of actions agreed by the meeting

5.1 The meeting developed an action plan for its future activities as shown in **Appendix F**.

Agenda Item 6: Any other business

6.1 The Secretariat suggested that Singapore may wish to consider introducing 50 NM longitudinal and intersecting track separation in the Singapore FIR using ADS. It was recognized that the CAAS was operating its ADS and CPDLC system successfully for a considerable period and had gained substantial operational experience. If the appropriate data link system performance met ICAO requirements for the application of ADS separation, in accordance with ICAO provisions, a reduced separation could be implemented, In particular a safety assessment would need to be conducted. Singapore agreed to look into the matter and would keep the meeting informed.

Agenda Item 7: Date and Venue for the SEACG/12 Meeting

7.1 The meeting agreed to hold the SEACG/12 meeting in conjunction with FIT-SEA/2 during the second quarter of 2005 at a date to be advised by the Secretariat. The venue for the meeting would be at the Regional Office Bangkok

Closing of the meeting

7.2 Mr. Moores, in closing the meeting, thanked the participants for their excellent cooperation. The meeting had made substantial progress on a number of important operational matters.

SAFETY ASSESSMENT FOR THE SOUTH CHINA SEA AIRSPACE WHERE A REVISED ATS ROUTE STRUCTURE AND A 60NM LATERAL SEPARATION MINIMUM IS PLANNED TO BE APPLIED - LATERAL SEPARATION ON PARALLEL TRACKS

Prepared by
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Summary

This paper provides a safety assessment for the South China Sea Airspace where a revised ATS route structure together with a 60NM lateral separation minimum between RNP 10 approved aircraft is planned. The safety assessment is carried out for lateral separation on parallel tracks and was completed using traffic movement data from October – November 2000. The paper estimates the effect the re-structure of the ATS routes would have on the lateral occupancy on the parallel tracks.

1. Introduction

1.1 This paper provides a safety assessment for the parallel tracks in the South China Sea Airspace where a revised ATS route structure together with a 60NM lateral separation minimum between RNP 10 approved aircraft is planned.

1.2 The data source for this safety assessment is the South China Sea traffic movement sample collected in October – November 2000. The results of analyzing the traffic movement data are presented below.

1.3 The traffic movement sample collected in October – November 2000 does not reflect the proposed re-structure of the ATS routes over the South China Sea. A new traffic movement sample should be collected to complete the safety assessment once the revised route structure has been implemented. This is particularly important to enable a safety assessment of a 50NM lateral route spacing to be carried out.

2. Background

2.1 The standard collision risk model that is used is

$$N_{ay} = P_y(S_y)P_z(0)\frac{l_x}{S_x}\left\{E_y(same)\left[\frac{\overline{|\Delta V|}}{2l_x}+\frac{\overline{|\dot{y}(S_y)|}}{2l_y}+\frac{\overline{|\dot{z}(0)|}}{2l_z}\right]+E_y(opp)\left[\frac{\overline{|V|}}{l_x}+\frac{\overline{|\dot{y}(S_y)|}}{2l_y}+\frac{\overline{|\dot{z}(0)|}}{2l_z}\right]\right\}$$

2.2 Table 1 presents the individual parameters used in the risk model, together with their definitions and assumed values. The values have been taken to be the same as in reference 2, where appropriate, and reflect the planned introduction of RVSM into the South China Sea airspace.

Model Parameter	Description	Value
N_{ay}	Number of fatal accidents per flight hour due to loss of lateral separation.	Calculated
S_y	Lateral separation minimum.	60NM
$P_y(S_y)$	Probability that two aircraft assigned to routes separated by the lateral separation minimum S_y are in lateral overlap.	Calculated (see below)
$P_z(0)$	Probability that two aircraft operating at the same flight level are in vertical overlap.	0.538
l_x	Average aircraft length.	0.0311NM
l_y	Average aircraft wingspan.	0.0282NM
l_z	Average aircraft height with undercarriage retracted.	0.0081NM
S_x	Length of longitudinal window used to calculate occupancy.	120NM
$E_y(same)$	Same direction lateral occupancy.	Calculated (see below)
$E_y(opp)$	Opposite direction lateral occupancy.	Calculated (see below)
$\overline{\lvert\Delta V\rvert}$	Average relative along-track speed between aircraft on same direction routes separated by the lateral separation minimum.	13 Kts
$\overline{\lvert V\rvert}$	Average absolute aircraft ground speed.	480 Kts
$\overline{\lvert\dot{y}(S_y)\rvert}$	Average absolute relative cross track speed for an aircraft pair that lose all of their assigned lateral separation.	75 Kts
$\overline{\lvert\dot{z}(0)\rvert}$	Average absolute relative vertical speed of an aircraft pair that is assigned to the same flight level on adjacent routes.	1.5 Kts

Table 1. Parameters associated with the Collision Risk Model for the Lateral Dimension.

2.3 Lateral occupancy is a measure of the density of traffic on a parallel route system. Lateral occupancy may be defined in terms of proximate pairs.

2.4 A pair of aircraft on adjacent parallel routes is said to be proximate if the aircraft cross adjacent fixes at the same level on their respective routes within the longitudinal window, S_x of each other, travelling in either the same direction for same direction occupancy, or in opposite directions for opposite direction occupancy.

2.5 Same (Opposite) direction lateral occupancy is defined as twice the number of same (opposite) direction proximate pairs divided by the total number of flights considered in the occupancy estimation.

2.6 Unfortunately, when a route structure is revised and new parallel routes introduced, there is no direct way of counting proximate pairs. Assuming the new parallel routes are one-way routes the (opposite direction) lateral occupancy can be estimated from the original opposite direction vertical occupancy by assuming the opposite direction traffic moves over to the adjacent route. The traffic in each route is then assumed to be spread out over the range of utilized levels and adjusted using the flow model (see reference 1). It is also necessary to adjust for the fact that vertical occupancy is usually calculated using a 10 minute longitudinal window, whereas lateral occupancy is calculated using a 120 NM longitudinal window. The final factor that is applied to the vertical occupancy figures is between 0.25 and 0.30, approximately.

2.7 Table 2 presents the results of the calculations at representative entry/exit points in the South China Sea Airspace. The data on which the calculations are based was collected in October and November 2000.

Entry/Exit Point	**Movements**	**Vertical Occupancy**	**Factor**	**Estimated Opposite Direction Lateral Occupancy**
3.4.1.1.1 POKIR	1529	0.2997	0.2930	0.0878
SUKAR	2910	0.5856	0.2575	0.1508
NISOR/NOMOK	1137	0.2057	0.3025	0.0622
Weighted Average	5576	0.4297		0.1155

Table 2. Occupancy Estimates for the South China Sea Airspace.

2.8 The value of $P_y(S_y)$, the probability that two aircraft assigned to routes separated by the lateral separation minimum S_y are in lateral overlap, depends on the core lateral navigational accuracy of the aircraft as well as on the prevalence of gross lateral deviations. It is assumed that the core lateral navigational accuracy is RNP 10, namely that 95 percent of the time the lateral deviations will be within 10NM of the route centreline.

2.9 Using the standard collision risk model presented above and using the parameter values in Table 1, with $E_y(same)=0$ and $E_y(opp)=0.1155$, it can be seen that

$$N_{ay} = P_y(S_y)\times 0.538 \times \frac{0.0311}{120} \times 0.1155 \times 16856.46$$
$$\cong P_y(S_y)\times 0.2715$$

2.10 Modelling the overall lateral errors of aircraft by double-double exponential densities, $DDE(y;a, l_1, l_2)$, where l_1 is related to the RNP value, and assuming that $l_2 = S_y$, as is usually done in lateral collision risk estimation, $P_y(S_y)$ may be readily calculated, see for example reference 4. Reference 4 also gives a relationship between $P_y(S_y)$ and z, the probability of a lateral error within 10NM of an adjacent route, and also between $P_y(S_y)$ and h, the probability of a lateral error at least as large as half of the route spacing.

2.11 Given the parameters and other values assumed above, if $z \leq 6.4\times10^{-6}$, or, equivalently, $h \leq 1.55\times10^{-4}$, then N_{ay} will be less than the Target Level of Safety of 5×10^{-9} fatal accidents per flying hour.

2.12 The North Atlantic (NAT) airspace has z error probabilities ranging from 6×10^{-5} to 8×10^{-5}. The NAT is, however, not a typical example. Its organised track structure (OTS) is constructed every 12 hours, and pilots are generally forced to enter route coordinates manually. This procedure is particularly error prone, especially since each OTS track is described in terms of waypoints at specified 10 degrees of longitude increments (20°W, 30°W, 40°W, etc).

2.13 It is anticipated that the South China Sea airspace will not experience as high gross errors as in the NAT and will be able to meet the TLS. A recent data collection from Indonesia provided a small sample (289 records) of aircraft deviation data. The data had no z errors and one possible h error, although this error was likely due to a weather deviation *and should not be included, provided the agreed weather deviation procedures were adhered to.* The sample is too small to provide more definite results as it is, in fact, consistent with RNP 10 navigational performance.

3 Conclusion

3.1 Provided the gross lateral errors in the South China Sea will be such that they satisfy $z \leq 6.4\times10^{-6}$, or, equivalently, $h \leq 1.55\times10^{-4}$, then the lateral collision risk will be less than the Target Level of Safety of 5×10^{-9} fatal accidents per flying hour. Because of the fixed nature of the track structure in the South China Sea, it is expected that this condition will be met, provided agreed weather deviation procedures are followed.

References

1. Air Traffic Services Planning Manual, ICAO DOD 9426-AN/924, 1984.

2. "A Preliminary Estimate of Values for the Collision Risk Model Parameters Relating to the Physical Characteristics of Aircraft", IP/11, Twelfth Meeting of the ICAO Reduced Vertical Separation Minimum (RVSM) Implementation Task Force RVSM/TF/12, Denpasar, Indonesia, 10 – 14 September 2001.

3. "Initial Estimate of Vertical Occupancy Values For Western Pacific - South China Sea Airspace Where The Reduced Vertical Separation Minimum (RVSM) Is Planned To Be Applied", WP/9, Eleventh Meeting of the ICAO Reduced Vertical Separation Minimum (RVSM) Implementation Task Force RVSM/TF/11, Kuala Lumpur, 30 April – 4 May 2001.

4. "Navigation Requirements for the Implementation of 50-nm Route Spacing in Oceanic Airspace", WP/4, Working Group A Meeting of the ICAO Review of the General Concept of Separation Panel, Annapolis, USA, 6 – 17 November 2000.

Asia Pacific Region - RVSM & RNP
DATA COLLECTION TEMPLATE

MANDATORY FIELDS												CONDITIONAL FIELDS						
FIR IDENTIFICATION:												CHANGES OF TRACK/LEVEL						
DATE	AIRCRAFT CALL SIGN	AIRCRAFT TYPE	ORIGIN AERODROME	DESTINATION AERODROME	ENTRY FIX INTO RVSM/RNP AIRSPACE	TIME (UTC) AT ENTRY FIX	FL AT ENTRY FIX	AIRWAY AT ENTRY FIX	EXIT FIX FROM RVSM/RNP AIRSPACE	TIME (UTC) AT EXIT FIX	FL AT EXIT FIX	FIX 1	TIME AT FIX 1	FL AT FIX 1	FIX 2	TIME AT FIX 2	FL AT FIX 2	DESCRIBE EVERY CHANGE THAT OCCURRED
															DRAFT			

INSTRUCTIONS FOR COMPLETION OF TRAFFIC SAMPLE DATA TEMPLATE

1 - Introduction

This guidance is to standardize the completion of the data collection template, aiming to obtain an air traffic movement sample for the safety assessment of operations in the Asia Pacific airspace. This template should be used for RVSM and RNP data. Microsoft "EXCEL" electronic format should be used and all air traffic movements for each day of the entire requested period should be shown in chronological sequence without any interposed blank lines or headings etc. All times should be in UTC. The completion of all fields is mandatory, except the fields contained in the "Optional Fields" area which should only be filled out if there is any change of flight level and/or airway.

Note: The Data Sample should describe daily air traffic movements at FL290 and above during the requested period, by FIR and on all air routes in the FIR.

MANDATORY FIELDS												OPTIONAL FIELDS						
FIR IDENTIFICATION:												PROGRESSING IN RVSM AIRSPACE						
DATE	AIRCRAFT CALL SIGN	AIRCRAFT TYPE	ORIGIN AERODROME	DESTINATION AERODROME	ENTRY FIX INTO RVSM AIRSPACE	TIME AT ENTRY FIX	FL AT ENTRY FIX	AIRWAY AT ENTRY FIX	EXIT FIX FROM RVSM AIRSPACE	TIME AT EXIT FIX	FL AT EXIT FIX	FIX 1	TIME AT FIX 1	FL AT FIX 1	FIX 2	TIME AT FIX 2	FL AT FIX 2	CONTINUE IF NECESSARY
07/07/04	MAS879	B744	WMKK	VHHH	DOLOX	12:20	320	M771	DUMOL	16:29	340	DAGAG	13:03	340				
07/07/04																		
07/07/04																		
08/07/04																		

2 - Mandatory Fields

• Line 02: FIR Identification

Complete using ICAO designators contained in Doc. 7910.
Examples: VLVT, WSJC, RPHI.

- **Column A: Date**

  Enter only numeric characters in the following way : dd/mm/yy
  Examples: February 01, 2004 enter 01/02/04.

- **Column B: Aircraft Call Sign**

  Enter a maximum of seven alphanumeric characters, with no blank spaces hyphens etc.
  Examples: BAW10, QFA08, SIA123.

- **Column C: Aircraft Type**

  Complete using ICAO designators contained in Doc. 8643.
  Examples: for Airbus A320-211 enter A320;
  for Boeing B747-438 enter B744.

- **Column D: Origin Aerodrome**

  Complete using ICAO designators contained in Doc. 7910.
  Examples: VDPP, VHHH, VTBD.

- **Column E: Destination Aerodrome**

  Complete using ICAO designators contained in Doc. 7910.
  Examples: WSSS, WMKK, WIII

- **Column F: Entry Fix into RVSM/RNP Airspace**

  Complete using a maximum of five alphabetical characters, normally the name of the fix/waypoint of entry into the relevant airspace.
  Examples: IBOBI, DOLOX, KABAM
  RMK: For flights climbing into the RVSM or RNP airspace, that do not cross the FIR boundary, the entry fix will be the fix prior to the first fix that the aircraft passes maintaining cruise level.

• **Column G: Time at Entry Fix**

Complete in UTC using numeric characters in the form: hh:mm
Examples: for 01 hour and 09 minutes enter 01:09;
for 12 hours and 23 minutes enter 12:23.

• **Column H: Flight Level at Entry Fix**

Complete using the three numeric characters corresponding to the flight level at the entry fix of RVSM or RNP airspace.
Examples: for FL290 enter 290; for FL310 enter 310.

• **Column I: Airway at Entry Fix**

Complete using a maximum of five alphanumeric characters, without space or hyphen.
Examples: L642, M771, L628
RMK: When aircraft change airways during the flight, the new airway must be reported after the first one separated by the character "/ ".
Example: L625/B348

• **Column J: Exit Fix from RVSM/RNP Airspace**

Complete using a maximum of five alphabetical characters, normally the name of the fix/waypoint of exit of the relevant airspace.
RMK: This fix will normally be the FIR limit, or the last one crossed by the aircraft while in level flight.
Examples: KABAM, VEPAM, ENREP

• **Column K: Time at Exit Fix**

Complete in UTC using numeric characters in the form: hh:mm
Examples: for 08 hours and 07 minutes enter 08:07;
for 00 hour and 48 minutes enter 00:48.

• Column L: Flight Level at Exit Fix

Complete using the three numeric characters corresponding to the flight level at the exit fix.
Examples: for FL330 enter 330; for FL350 enter 350.

3 – Optional Fields ("Progress of the flight through the Airspace")

• Column M: Fix 1

Complete using a maximum of five alphabetical characters, according to the name of the fix where flight level and/or airway changes have been made.
Note: This fix will be the last one the aircraft has crossed in level (cruise) flight.

• Column N: Time at Fix 1

Complete in UTC using numeric characters in the form: hh:mm
Examples: for 10 hours and 05 minutes enter 10:05;
for 12 hours and 23 minutes enter 12:23.

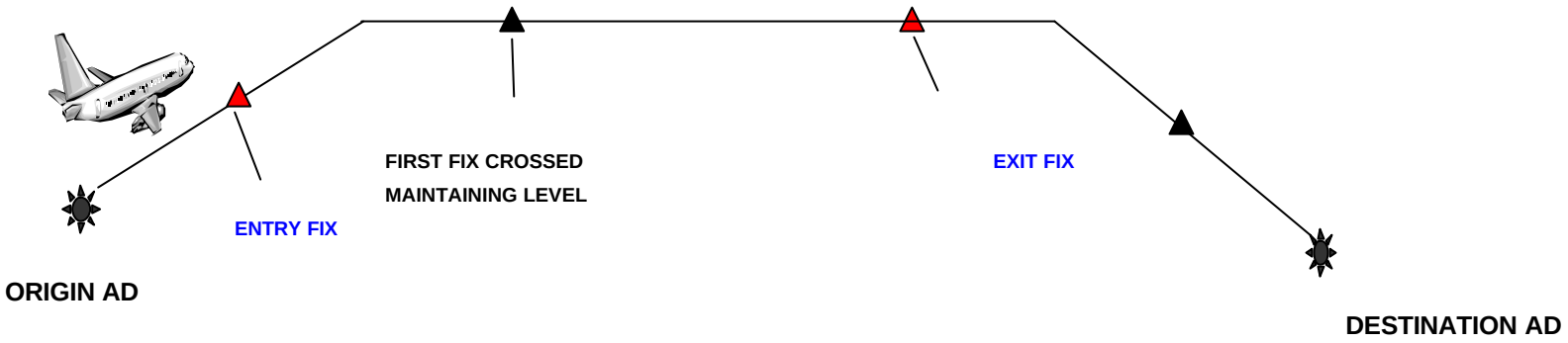
• Column P: Flight Level at Fix 1

Complete using the three numeric characters corresponding to the flight level at the fix 1.
Examples: for FL370 enter 370;
for FL410 enter 410.

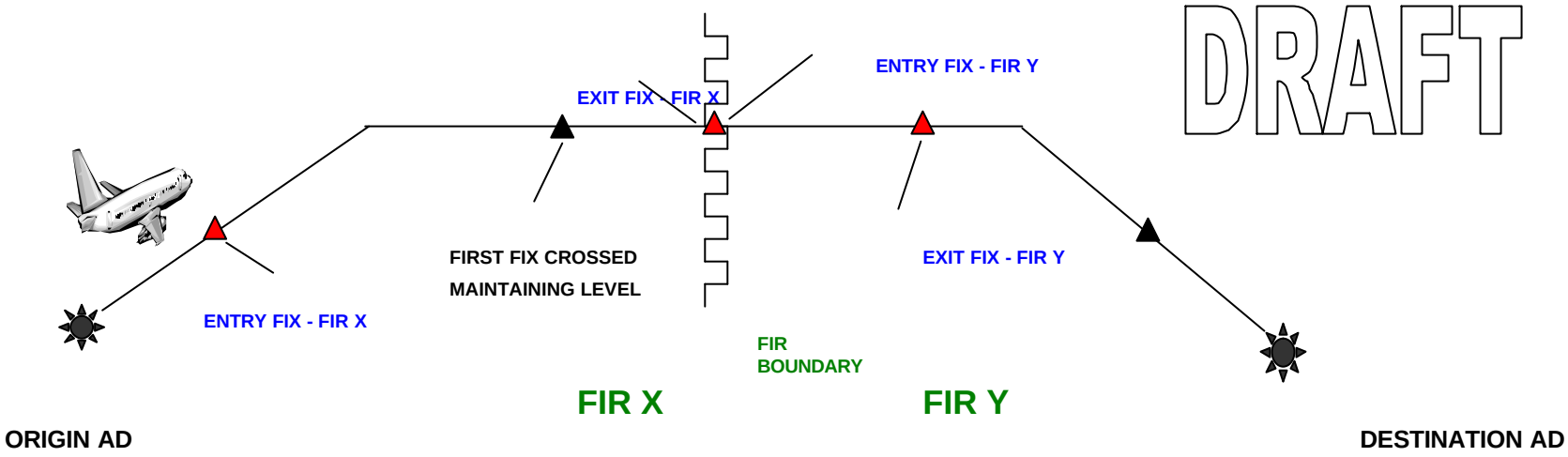
Note: Complete as many "Fix/Time/Flight-Level" fields as are required to describe every change that occurred.

APPENDIX

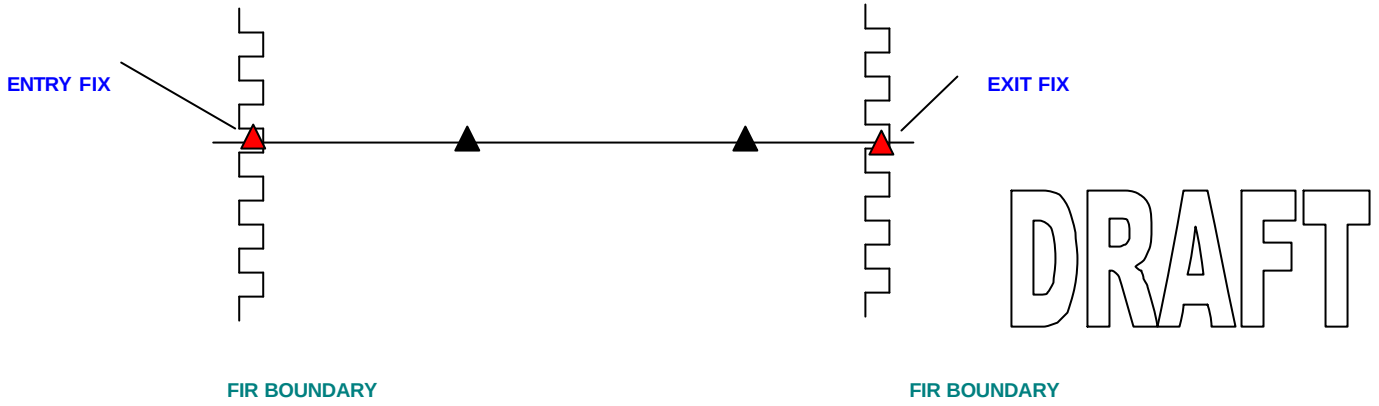
Example 1: Flight with origin and destination in the same FIR.



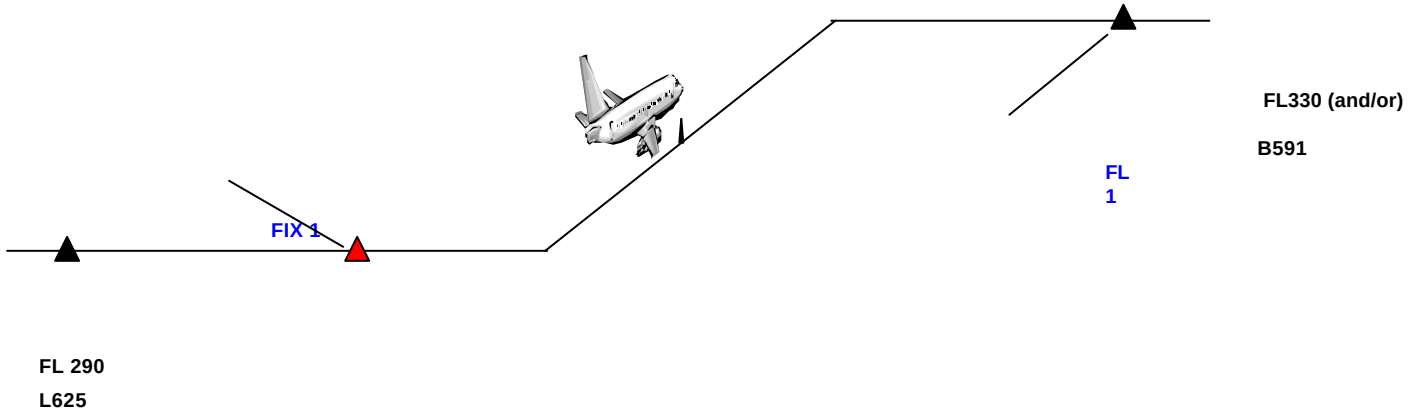
Example 2: Flight with origin and destination in different FIR



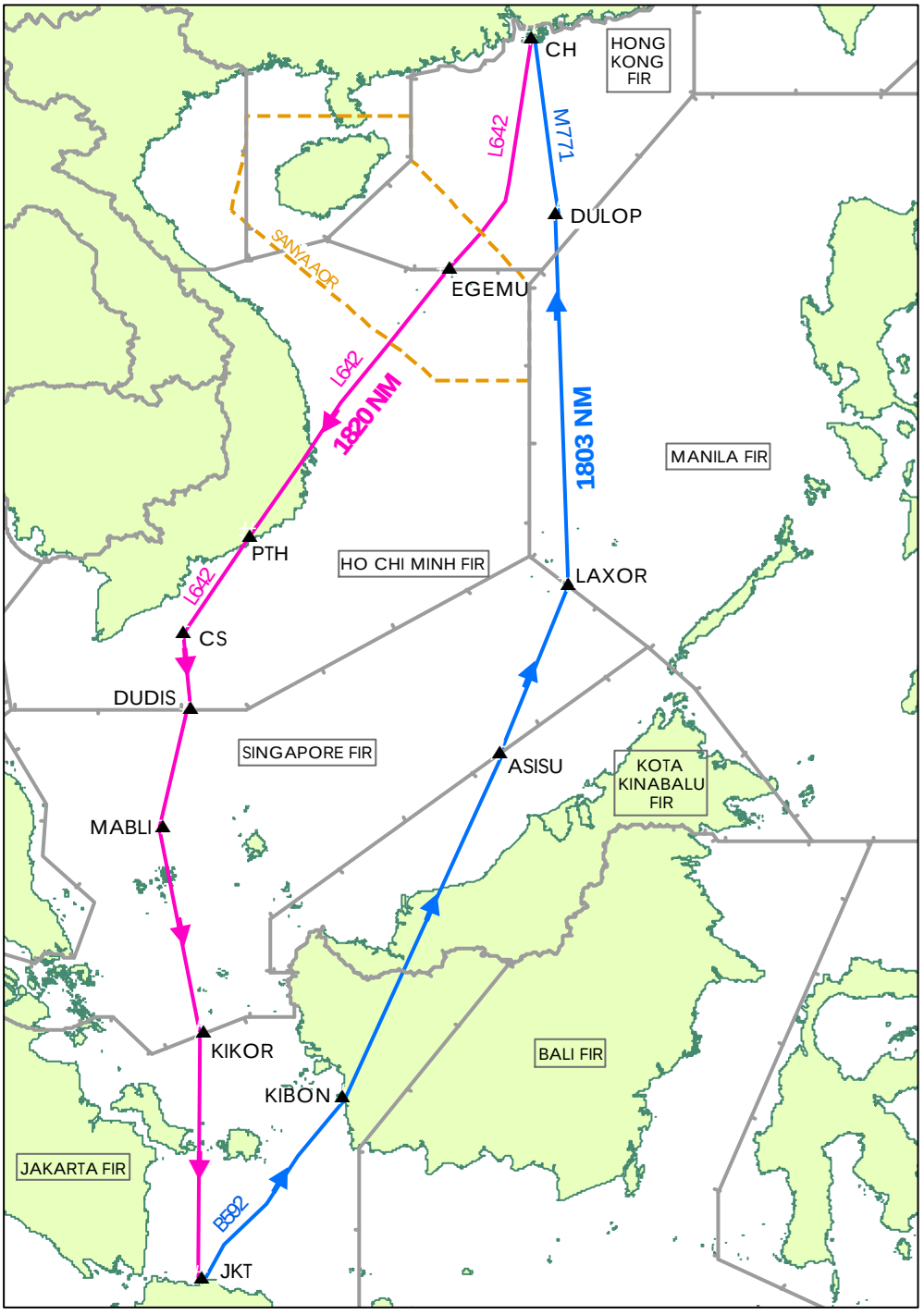
Example 3: Flight crossing FIR boundaries.



Example 4: Flight with change of FL and/or AWY (OPTIONAL FIELDS)



PROPOSED HONG KONG/JAKARTA ROUTES



7-NEW RNP-10 ROUTE WITHIN NON EXCLUSIVE INDONESIA AIRSPACE

Existing Route	Deleted Route	Draft New RNP_10 routes		*Point Of Identification*			Remarks
		Designator	Lower FL	Route	FL Configuration	Service	
G220	G-220	N-645	280	N-645/ DKI – KIKOR	F460/F275	DCPC	One-way
-	-	-	-	-	-	-	-
A576	-	M-635	280	M-635/ TPG-Sanos-Rampy-Curtins	F460/F275	DCPC	Two-way
				A576/TPG-Sanos-Sabil-DPS-Fir	F270/F155	Mixture	Two Way
A464	-	M-774	280	M-774/TPG-Kikor-Kikem	F460/F275	DCPC	Two way
				A464/TPG-Kikor-Kikem	F270/F155	Mixture	Two Way
G464	-	P-763	280	P-763/Arupa-Rozax-BLI	F460/F275	DCPC	Two Way
				G464/Arupa-Rozax-BLI	F270/F155	Mixture	Two way
B592	-	P-648	280	P-648/DKI-Akula-Kobas—x FIR-KK	F460/F275	DCPC	Two Way
				B592/DKI-Akula-Kobas-x FIRKK	F270/F155	Mixture	Two Way
B584	-	M-522	280	M522/DPS-Mamok – K.Kinabalu	F460/F275	DCPC	Two Way
				B-584/ DPS-Elang-Mamok-K.Kinablu	F270/F155	Mixture	Two Way
B583	-	M- 768	280	M768/Mamok-Elbis	F460/F275	DCPC	Two Way
				B583/Mamok- Elbis	F280/F175	Mixture	Two Way

MAAR DUTIES AND RESPONSIBILITIES

The tasks listed in the below table apply to the safety monitoring activities for the RVSM implementation in Asia region, including Western Pacific/South China Sea (WPAC/SCS) and Bay of Bengal (BOB).

Item	Description	Frequency	Remark
1	- Maintain Point of Contact (POC) database - Share POC data	- As received - As requested	
2	Collect, maintain, and sharing approval data of all aircraft from all States under responsibility of MAAR	Monthly	MECMA and PARMO
3	Administer height keeping performance (HKP) monitoring for aircraft registered in Asia region	As requested	
4	Maintain HKP data for all aircraft monitored by MAAR (at least)	As monitored, but at least monthly	
5	Monitor and report large height deviation (LHD)	Monthly	Report to ICAO-RASMAG
6	Conduct airspace safety review; - Safety oversight - Compliant status of aircraft operated in this region	Quarterly	Require the collection traffic sample data (TSD) of at least one month. Incorporate with LHD data
7	MAAR File Management and Back up	Monthly, as specified in MAAR Operational Procedure	Back up all MAAR-related files

MAAR FUTURE WORKS

The future works of MAAR listed in the below table.

Work Items	Description	Related Meeting	Month	Status
Bay of Bengal				
1	Request TSD for June 04	RVSM/TF/21	March 04	- Completed - Expect to received TSD by 31 Aug 04
2	Collect/follow up LHD reports		Monthly	
3	Collect the submitted one-month TSD		Shall received TSD by 31 Aug 04	TSD will be collected by July 04
4	Conduct airspace safety review quarterly - Safety oversight - Compliant status monitoring for aircraft operated in this region	- RASMAG - RVSM/TF	- July 04 – RASMA - Oct 04 (New TSD) – RASMAG and RVSM/TF/22 (Nov) - Feb 05 – RASMAG - Ongoing…	
Western Pacific/South China Sea				
1	Request TSD for a selected month of 2004?	- FIT-SEA? - SEACH? - ATS Coordination Meeting?	- May 04 - May 04 - Sep 04	Month of collection will be decided by the selected meeting
2	Collect/follow up LHD reports		Monthly	
3	Collect TSD			
4	Conduct airspace safety review; - Safety oversight - Compliant status monitoring for aircraft operated in this region	- RASMA - RVSM/TF 0- ATS Coordination?	???	Time of conducting Airspace Safety Review Report will be determined based on the time of new TSD collection

Currently, MAAR is coordinating with Airservices Australia to establish safety management program to support the needs of safety assurance for the Asian airspace. The progress of this establishment is expected to be informed to the next RASMAG meetings.

SEACG/11 ? ACTION PLAN

IMMEDIATE: Action to be taken immediately after the conclusion of the meeting
MID TERM: Action to be taken within six months
LONG TERM: Action to be taken within one year

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
1.	**Traffic Sample Data (TSD) to be collected for RVSM and RNP 10 safety assessments.** As well as traffic sample data on the SCS parallel routes, sample data is required for the crossing routes to facilitate analysis of intersecting traffic.	IMMEDIATE	All SEA States, Thailand (MAAR)	OPEN	Raised at SEACG/11. TSD required for July 2004 and submitted to MAAR by 1 September 2004. MAAR Contact details: Email (preferred)**:** **maar@aerothai.co.th** Fax: 662 287 8155 Address: Monitoring Agency for Asia Region (MAAR) ATS Operations Bureau, AEROTHAI 102 Ngamduplee Tungmahamek, Sathorn Bangkok 10120 Thailand.
2.	**Preparation and distribution of Traffic Sample Data (TSD) template**	IMMEDIATE	Thailand (MAAR)	OPEN	Raised at SEACG/11. MAAR and Regional Office to revise the TSD template to include RVSM and RNP requirements and make template available to States. **maar@aerothai.co.th**

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
3.	**Update RVSM approval records for all aircraft registered by each State.** All States to ensure up to date records held on RVSM status of aircraft on respective registers.	IMMEDIATE	All States, MAAR	OPEN	Raised at SEACG/11. In addition to State records, RVSM status to be provided by States to MAAR. **maar@aerothai.co.th**
4.	**Continue to provide Large Height Deviation (LHD) reports to MAAR.**	IMMEDIATE	All States, MAAR	OPEN	Raised at SEACG/11. States to ensure LHD reports (including 'NIL' reports) are provided to MAAR in accordance with published reporting requirements. **maar@aerothai.co.th**
5.	**Deficiencies – Update APANPIRG Deficiencies Listing.**	MID TERM (August 2004)	All SEA States, Regional Office	OPEN	Raised at SEACG/11. States to check and confirm current status of deficiencies listing and advise Regional Office of amendments. Regional Office will prepare updated listing for APANPIRG/15 (August 2004).

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
6.	**Review FLOS in SCS area.** Current operations utilize a modified single alternate FLOS in the SCS area, leading to transition areas to/from surrounding single alternate FLOS areas.	MID TERM (September 2004)	All SEA States, MAAR	OPEN	Raised at SEACG/11. The SEACG/11 decided that resolving the use of the FLOS was a high priority. A special coordination meeting of the RVSM taskforce has been scheduled for 20-24 September 2004 to address this issue. States should prepare their position prior to this meeting.
7.	**Proposal to Establish Additional ATS Routes for Brunei-Middle East/Europe Flights.** That, Brunei Darussalam discuss the suggested options for shorter routes with Royal Brunei Airlines and advise States, ICAO and IATA on the outcomes. IATA should work with these States to arrive at a viable solution.	MID TERM (December 2004)	Brunei Darussalam with Indonesia, Malaysia, Singapore, Thailand, Viet Nam & IATA	OPEN	at SEACG/10. Brunei Darussalam was not represented at the SEACG/11 meeting, so no update was available. Regional Office to coordinate with Brunei Darussalam.
8.	**Deletion of Requirements for A205 and G580.** That, Brunei Darussalam and Malaysia co-ordinate with ICAO for a necessary amendment to Asia/Pacific ANP in order to delete the requirements for A205 and G580 from the Asia/Pacific ANP.	MID TERM (December 2004)	Brunei Darussalam, Malaysia, Regional Office	OPEN	Raised at SEACG/10. Brunei Darussalam was not represented at the meeting. Malaysia reported that they would prefer to retain A205, and that the portion of G580 between BRU and VJN was replaced by B348. The Regional Office would coordinate with Brunei to progress this matter. An amendment to the ANP required. Regional Office will coordinate the raising of the ANP amendment.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
9.	**Proposal to Establish Additional ATS Routes for Hong Kong/Jakarta City Pair.**	MID TERM (December 2004)	China, Hong Kong China, Indonesia, Malaysia, Philippines, Singapore, Viet Nam, Regional Office, IATA	OPEN	Raised at SEACG/10. Implementation of Option 2 in IATA proposal to SEACG/11 – see paragraph 3.40 and Appendix C of SEACG/11meeting report. States/IATA to undertake enabling activities,, e.g. Safety Assessment. ANP amendment required. Regional Office will coordinate the raising of the ANP amendment.
10.	**Review the airspace arrangements for ATS routes and transfer of control in points in Viet Nam's airspace. Viet Nam/adjacent States/ICAO** That, Viet Nam and adjacent States concerned review and coordinate with Regional Office on the airspace arrangements for ATS routes and transfer of control points to improve the efficiency of providing air traffic control services in the Ha Noi and Ho Chi Minh FIRs.	MID TERM (December 2004)	Viet Nam, adjacent States, Regional Office	OPEN	Raised at SCS/TF/8. The SEACG/11 meeting clarified that the main issue was in regard to weather deviation on L628 and Viet Nam requested that this matter required further consideration at the next meeting. The meeting agreed to keep this item open.
11.	**China Danger Areas affecting A1 and P901.** That, in order to allow all aircraft to use A1/P901 H24:	MID TERM (December 2004)	China, Viet Nam, Hong Kong, China	OPEN	Raised at SCS/TF/8. China reported to SEACG/11 that A1 and P901 would be realigned to avoid the danger areas and be available H 24.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	c) China investigates the possibility of amending the operating hours of D155, D156, D157 and D158; or, b) Viet Nam, China and Hong Kong, China take steps to realign P901 to be clear of the Danger Areas and realign A1 so as to be below P901.				
12.	**Radar Separation on A202.** That, States concerned work together to introduce radar separation procedures on ATS route A202 in a staged approach, initially commencing with 40NM spacing between aircraft at the same altitude.	MID-TERM (December 2004)	Hong Kong China, China, Vietnam, Lao PDR, Thailand	OPEN	Raised at SCS/TF/8. SEACG/11 - Letter of Agreement in place between adjacent States allowing use of 40 NM separation. Thailand to implement from 1 July 2004 following training.
13.	**Standardize Lower Limits of RNP Airways in the SCS Route Structure and establish RNAV routes beneath** Apply standard lower limit of F285 wherever possible across RNP10 routes. Establish RNAV routes beneath RNP routes where required.	MID TERM (December 2004)	All SEA States, IATA	OPEN	Raised at SEACG/11. RNAV routes to accommodate non-RNP10 aircraft to be established under existing SCS RNP10 routes with upper limit at FL285 where possible and required. Arrangements to be kept under review, changes subject to safety assessment. Hong Kong, China to prepare draft AIP supplement and circulate to States and IATA for comment. All States should adopt the same wording.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
14.	**Designation of RNP airspace for non-RNP operations on P901/L642/M771.** The vertical limits of RNP airspace to be designated.	MID TERM (December 2004)	All States concerned	OPEN	Raised at SEACG/11. State AIPs require amendment to state the applicability of RNP airspace.
15.	**Implementation of lateral offset procedures.**	MID TERM (December 2004)	All States, Regional Office	OPEN	Raised at SEACG/11. To be actioned by all States following publication of revised ICAO guidelines for 2 NM offset procedures.
16.	**Establishment of safety monitoring agency for Asia Region**	MID TERM (December 2004)	Thailand (MAAR)	OPEN	Raised at SEACG/11. Thailand (MAAR) to coordinate arrangements with Airservices Australia and report results to RASMAG/2 (October 2004).
17.	**Establishment of Central Reporting Agency for South-East Asia**	MID TERM (December 2004)	Japan	OPEN	Raised at SEACG/11. Japan ATCA to discuss arrangements with Boeing on the setting up of the CRA and report to RASMAG/2.
18.	**Include No-PDC review on the SEACG/12 agenda** In light of advances in ATM automation and other means available to determine flight level allocation, No-PDC procedures may not facilitate	MID TERM (December 2004)	Regional Office	OPEN	Raised at SEACG/11. Regional Office to ensure inclusion on SEACG/12 Agenda for discussion.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	flexible use of flight levels.				
19.	**Update SCS route structure safety assessment post implementation of the route structure.** Safety assessment undertaken prior to implementation used data from existing route structure. This assessment identified the requirement for follow up safety assessment after implementation using data obtained from new routes. The SCS route structure implementation occurred in November 2001.	MID TERM (December 2004)	All SEA States, MAAR	OPEN	Raised at SEACG/11. Currently no Safety Monitoring Agency (SMA) exists for SEA. MAAR and Airservices Australia are in consultation about setting up an SMA capable of doing this work – Action Item 15 refers.
20.	**Update on ADS/CPDCL implementation planning**	MID TERM (December 2004)	All SEA States	OPEN	Raised at SEACG/11. States to update ATM/AIS/SAR/SG/14 (28 June-2 July 2004) on their ADS/CPDLC implementation plans with timelines for implementation.
21.	**Implementation of Radar Handover Procedures.** That, States identify areas where radar handover procedures can be applied at common FIR boundary, and implement the procedures.	LONG TERM (June 2005)	All SEA States	OPEN	Raised at SEACG/10. The SEACG/11 meeting was advised that many States had introduced radar handover procedures. Some States identified areas were progress was still to be made and agreed to move towards radar handover procedures as soon as possible.
22.	**Implementation of RNP 10 and RNP 4 routes** The meeting	LONG TERM	All States	OPEN	Raised at SEACG/11.

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
		(June 2005)			Ongoing implementation of RNP 10 routes as required. Areas suitable for RNP 4 and reduction of en-route separation to be considered.
23.	**Re-alignment of RNP 10 ATS routes N892 and L625.**	LONG TERM (June 2005)	China, Philippines, Singapore, Viet Nam, IATA	OPEN	Raised at SCS/TF/8. Viet Nam reported at SEACG/11 that realignment proposal would take these routes outside radar and VHF coverage. Introduction of Viet Nam ADS/CPDLC was expected in 2007 and would facilitate route realignment at that time. No action could be taken at this time.
24.	**A202 Metric Cruising Levels transition** Consideration should be given to an alternate arrangement to the metric cruising level system for operations on A202 to facilitate flights with ceiling limitations.	LONG TERM (June 2005)	China, Hong Kong China	OPEN	Raised at SEACG/10.
25.	**Implementation of ADS-B**	LONG TERM (June 2005)	All States	OPEN	Raised at SEACG/11. States to identify areas for ADS-B implementation and to notify users by AIC at earliest opportunity.

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LIST OF WORKING AND INFORMATION PAPERS

FIT-SEA/1

WORKING PAPERS

WP/No.	Agenda Item	Subject	Presented by
1	1	Revised Provisional Agenda for FIT-SEA/1	Secretariat
2	2	Establishment of a FANS Implementation Team (FIT) for the Southeast Asia (SEA) Region	Secretariat
3	2	FIT-SEA Terms of Reference and Work Plan	Secretariat
4	3	FANS 1/A Operations Manual (FOM) Version 1.0, 01 March 2004	Secretariat
5	4	Establishment of a Central Reporting Agency (CRA) for the South-East Asia Region	Secretariat
6	5, 6	Development of the Operational Plan for ADS/CPDLC Implementation in the South China Sea area	Secretariat
7	4	Proposal on FIT-SEA CRA Service	Japan
8	2	Proposal of Japan on Participation in FIT-SEA Activities	Japan
9	6	ATS Data Link System Integrity and Monitoring	Japan

INFORMATION PAPERS

IP/No.	Agenda Item	Subject	Presented by
1	1	Revised Provisional Agenda for FIT-SEA/1	Secretariat
2	5	Brief on Vietnam Air Navigation System and its Gratitude for Approval of Membership of Vietnam to APANPIRG	Viet Nam
3	6	Summary Report on CRA of Japan	Japan
4	6	Website address of CRA Japan	Japan

SEACG/11

WORKING PAPERS

WP/No.	Agenda Item	Subject	Presented by
1	1	Adoption of Provisional Agenda	Secretariat
2	2	Action Items from SEACG/10	Secretariat
3	2	Action Items from SEACG/8	Secretariat
4	3	Review of RVSM Implementation and Follow-up in the Western Pacific and South China Sea and the Bay of Bengal and Beyond areas	Secretariat
5	3	Air Navigation Deficiencies in the ATS/AIS Fields	Secretariat
6	4	Safety Assessment for RNP 10 Operations in the SCS	Secretariat
7	3	Implementation of Lateral Offsets in the Non-Radar Oceanic Airspace of Southeast Asia	Secretariat
8	3	The Provision of ATS (Air Traffic Services) over Bangkok AOR (Area of Responsibility) in the South China Sea	Cambodia
9	3	Non-RNAV Flights on RNAV Routes	Hong Kong, China
10	3	Review of South China Sea Route Structure	IATA
11	4	Mission to MAAR	Thailand
12	3	Planning and Implementation RNP-10 within Indonesia Non Exclusive airspace	Indonesia
13	5	Air Traffic Management Consideration	Thailand

INFORMATION PAPERS

IP/No.	Agenda Item	Subject	Presented by
1	6	RVSM Implementation Plan in the Tokyo, and Naha FIRs	Japan
2	4	Brief on Vietnam Air Navigation System and its Gratitude for Approval of Membership of Vietnam to APANPIRG	Viet Nam

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