INTERNATIONAL CIVIL AVIATION ORGANIZATION

**REPORT OF THE SIXTH MEETING OF THE
ASIA/PACIFIC AIRSPACE SAFETY MONITORING TASK FORCE
(APASM TF/6)**

HONOLULU, HAWAII, U.S.A., 5 – 7 MAY 2003

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

Adopted by the Task Force
and published by the ICAO Asia and Pacific Office

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PART I – HISTORY OF THE MEETING

1.   **Introduction**

1.1   The Sixth Meeting of the Asia/Pacific Airspace Safety Monitoring Task Force (APASM/TF/6) was held in Honolulu, Hawaii, United States from 5 to 7 May 2003 hosted by the United States Federal Aviation Administration (FAA).

2.   **Attendance**

2.1   The meeting was attended by 14 experts from 8 States and 2 International Organizations. A list of participants is at **Appendix A** to this report.

3.   **Officers and Secretariat**

3.1   Mr. Jeffrey Bollard, Chief Engineer – Technical Standards of Airservices Australia, acted as Chairperson and presided over the meeting throughout its duration.

3.2   Mr. David J. Moores, Regional Officer Air Traffic Management (ATM), ICAO Asia and Pacific Office was the Secretary for the meeting.

4.   **Opening of the Meeting**

4.1   Mr. David Moores, on behalf of Mr. Lalit Shah, Regional Director of the ICAO Asia and Pacific Region, welcomed participants. He thanked the FAA for hosting and providing support for the meeting. This meeting was expected to complete the work programme of the Task Force and to present its recommendations on the establishment of a regional airspace safety monitoring organization to the Fourteenth Meeting of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/14) to be held from 4 to 8 August 2003. He advised the meeting that due to the outbreak of the Severe Acute Respiratory Syndrome (SARS) in Asia, the meeting schedule of the Regional Office had been disrupted during April and May, and the Thirteenth Meeting of the ATS/AIS/SAR Sub Group had been postponed to 23-27 June 2003. He recognized the difficulties States in the region are experiencing dealing with the SARS problem and the effects of the Iraq war and the world economic climate have on the airline industry. ICAO along with its Contracting States are endeavouring to support the recovery of civil aviation, and he thanked participants for their continued effort on the Task Force and looked forward to a fruitful meeting.

4.2   Mr. Jeffrey Bollard in his opening remarks welcomed participants and thanked the FAA for providing an excellent venue for the meeting. He summarized his expectations for the meeting, which should focus on completing the outstanding work to finalize the plan for the establishment of the Asia Pacific Airspace Safety Advisory Group (APASAG) to be presented to APANPIRG/14. He emphasized the importance of resolving the principle outstanding issues to finalize the structure and funding arrangements. Mr. Bollard acknowledged and welcomed the new participants from Japan and New Zealand.

5.   **Language and Documentation**

5.1   All discussions were conducted in English. Documentation was issued in English. A total of 9 Working Papers and 3 Information Papers were considered by the meeting. A list of the Working and Information Papers is at **Appendix B.**

PART II - REPORT ON AGENDA ITEMS

Agenda Item 1:   Adoption of Agenda

1.1   The meeting considered the provisional agenda and adopted it as the agenda for the meeting:

Agenda Item 1:   Adoption of Agenda

Agenda Item 2:   Airspace monitoring requirements

a)   develop a handbook detailing requirements for horizontal monitoring including State responsibility to provide data; and
b)   develop a handbook detailing requirements for communications/ navigation systems including State responsibility to provide data.

Agenda Item 3:   Development of the organization and structure for APASAG

a)   develop the plan for APASAG; and
b)   organizational models for the ASASAG structure.

Agenda Item 4:   Financial arrangements

a)   cost of performing current monitoring services;
b)   funding requirements;
c)   funding arrangement;
d)   level of user charges for airspace safety monitoring; and
e)   coordinate with other regional monitoring organizations to harmonize charges for air navigation services.

Agenda Item 5:   Report to APANPIRG/14

Agenda Item 6:   Review the action plan

Agenda Item 7:   Future Work – Meeting Schedule

Agenda Item 8:   Other Business

Agenda Item 2:   Airspace monitoring requirements

2.1   The United States and Japan presented the meeting with the second draft of the handbook on *Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems for the Asia/Pacific Region* (**Appendix C** refers). The meeting recalled that the purpose of this guidance material is to provide a set of working principles common to all States or regions implementing ATS data link systems including ATS Interfacility Data Communication (AIDC). The handbook is intended to assist States implement ATS data link systems with detailed guidance on the requirements for establishing and operating monitoring programmes. It will also help promote a standardized implementation approach among regions and operators. The meeting agreed that the final version of the handbook would be included in the Task Force report to APANPIRG/14.

2.2   The United States advised the meeting that work was continuing on the development of the handbook for monitoring required navigation performance (RNP) applications, which had been agreed at the

APASM/TF/5 meeting (February 2002). This material would provide guidance for monitoring in connection with application of RNP in the international airspace of the Asia Pacific Region. A final version of the handbook would be available to be included in the APASM Task Force report to APANPIRG/14.

Agenda Item 3:   Development of the organization and structure for APASAG

Plan for the establishment of a regional airspace safety monitoring organization

3.1   The meeting was presented with information by the United States on the North Atlantic System Planning Group (NAT SPG) Scrutiny Group, which has a similar role to that envisaged for APASAG and could assist the meeting develop the Terms of Reference (TOR's) and organizational structure for APASAG.

3.2   The meeting was presented with information provided by IATA, which outlined requirements to be considered in the development and organization of a structure to undertake regional airspace monitoring activity in accordance with ICAO Policies. This also included information on financing of monitoring activities, which would be considered under Agenda Item 4.

3.3   Information was presented by Japan on the establishment of a monitoring programme for ATS data link interoperability for the East and Southeast Asia area. It was noted that a number of ATS providers have the capability to provide ATS data link services. In order to introduce ATC services using these systems, a monitoring programme needs to be established. In this regard, Japan, with its experience participating in the Central Reporting Agency (CRA) for the Pacific Region, indicated that it would be willing to participate in such a programme for the Asia Region. The meeting was advised by the Secretary that the APANPIRG ATS Coordination Groups for Southeast Asia (SEACG) and the Bay of Bengal (BBACG) would be the appropriate fora in which to address this matter. In regard to the timing of these meetings, the SEACG/11 meeting scheduled in April was postponed due to SARS. In view of a backlog of meetings postponed because of SARS and the meeting schedule of the Regional Office for the remainder of the year, the dates for convening these meetings has not yet been determined. It is recognized that States in the Asia Region are showing an interest to introduce ATS data link services, and the establishment of FANS Interoperability Teams (FITs)/CRA programmes should be a priority. Further, coordination with States to establish these programmes is being pursued by the Regional Office.

3.4   The meeting recalled that the APASM/TF/5 meeting agreed that an organization that best met the envisaged role of a regional airspace safety monitoring agency should be established as a Sub-Group of APANPIRG. The establishment of a Sub-Group would avoid requiring a formal instrument such as a charter or multi-national agreement to be established for Contracting States to make use of monitoring services, and this would simplify the process to establish a regional monitoring organization. The meeting agreed that the Sub-Group should be established in accordance with the APANPIRG Procedural Handbook.

3.5   At the APASM/TF/4 meeting (December 2002), the role of the regional monitoring organization had been changed to that of an advisory group named the Asia Pacific Airspace Safety Advisory Group (APASAG), and this had been confirmed and further developed at APASM/TF/5. The meeting reviewed the suitability of the proposed new name in the context of a Sub-Group of APANPIRG. The name had been changed to the Asia/Pacific Airspace Safety Monitoring Advisory Group from the Regional Airspace Safety Monitoring Agency (RASMA) endorsed by APANPIRG/13. The meeting noted that the primary change in the functioning of the organization was to become an advisory body rather than a business entity that provided technical monitoring services. In this regard, the meeting recognized that under the Annex 11 provisions on safety management systems, States are responsible to provide airspace safety monitoring services, and at a regional level this would be by regional agreement. The meeting confirmed that the role of the regional airspace monitoring organization envisaged for the Asia/Pacific Region should be in an advisory capacity, hence the decision by APASM/TF/5 to establish a Sub-Group of APANPIRG and adopt the term

"Advisory Group".

3.6   The meeting, on reviewing the naming of the Sub-Group, was of the view that it would be desirable to revert to the original name of Regional Airspace Safety Monitoring Agency (RASMA) and change "agency" to "advisory" to reflect the agreed role for the Sub-Group, which is essentially advisory in nature. The meeting agreed that the name should be changed to the Regional Airspace Safety Monitoring Advisory Sub-Group (RASMA/SG). Also, The meeting noted that the name APASAG implied a much broader role than that intended by APANPIRG.

3.7   The meeting developed draft TORs (**Appendix D),** an organizational structure (**Appendix E)** and work flow chart (**Appendix F**) for the RASMA/SG to be presented to APANPIRG/14. A plan for the operation of RASMA/SG will be completed by correspondence and presented to APANPIRG/14. The draft plan is contained at **Appendix G**.

3.8   The meeting agreed that in view of the progress made to complete its work programme to develop an airspace safety system performance monitoring structure for the Asia Pacific Region, the Task Force was in a position to recommend to APANPIRG/14 that the RASMA/SG be established.

3.9   In light of the above, the meeting developed a Draft Decision to APANPIRG/14 as follows:

Draft Decision 14/xx - Establishment of the Regional Airspace Safety Monitoring Advisory Sub Group of APANPIRG

That, a Regional Airspace Safety Monitoring Advisory Sub-Group (RASMA/SG) be established to report to APANPIRG. The Terms of Reference of the Sub Group are as shown in Appendix […] to the Report on Agenda Item x. The establishment and the work of the Sub Group shall be governed by the considerations contained in the APANPIRG Procedural Handbook.

3.10   In regard to the composition of the RASMA/SG, the meeting noted that in order to successfully accomplish its work, the qualifications and experience needed for the reviewing and evaluating of airspace safety risk and safety assessments are highly specialized. Accordingly, the RASMA/SG should be composed of appropriately qualified experts (e.g. mathematician, air traffic services, flight operations and airworthiness) from States within the Asia Pacific Region, as well as representatives from the regional airspace safety monitoring agencies and international organizations. Also, it is important that the RASMA/SG identifies trends in possible systemic problems from the monitoring results of the contributing organizations in the region, and takes appropriate remedial action.

Agenda Item 4:   Financial arrangements

4.1   The meeting was presented with information by the United States on experience gained from implementation of RVSM in the Asia Pacific Region, which suggested a suitable mechanism for funding necessary monitoring activities associated with recent and anticipated airspace changes in the Region.

4.2   At the APANPIRG/9 meeting (August 1998), the ICAO RVSM Implementation Task Force (RVSM/TF) was established and it was agreed to implement RVSM within selected FIRs in the Pacific Region planned for February 2000.

4.3   The RVSM/TF/2 meeting accepted an offer confirmed by APANPIRG/10 (August 1999) for the FAA Technical Center to act as the regional monitoring agency (RMA) for the Asia Pacific Region as called for in ICAO RVSM guidance material (Doc 9574). This agency is called the Asia Pacific Approvals Registry and Monitoring Organization (APARMO).

4.4   The GPS-Based Monitoring System, as developed by the FAA Technical Center to support RVSM implementation in the North Atlantic (NAT) Region, would be used to assess the compliance of aircraft height-keeping performance with established requirements. These services were provided by the APARMO without charge as part of FAA contributions to Regional RVSM implementation. The Technical Center stated that it would supply key components of the GPS-based Monitoring System, GPS Monitoring Units (GMUs) from FAA inventory without cost, but had neither the staff necessary to collect data with the units nor the funds to contract for such services. Further, the Technical Center noted that it could not accept funds for this purpose from any entity outside of the U. S. Federal Government without special arrangements.

4.5   Recognizing that there was no Pacific user fee collection system similar to that of the NAT in place, the IATA Asia Pacific Office offered to conduct an evaluation of private-sector firms' tenders to offer GMU monitoring services to operators in connection with the Pacific RVSM implementation programme. As part of its evaluation of these proposals, IATA asked the Technical Center to answer two questions, based on its NAT experience, in regard to each of the firms:

        1)   was the firm technically competent to offer the GMU monitoring service?; and

        2)   would the firm's proposed administrative and logistics processes support the Technical Center in the overall application of the GPS-based Monitoring System?

Other than responding to these questions, the Technical Center played no part in the IATA process of selecting the GMU service provider. The Technical responded affirmatively to both questions for both firms.

4.6   The IATA Regional Coordinating Group (RCG) chose the private sector firm to provide GMU monitoring services. The RCG decision was based on economic considerations of cost and flexibility of service provision. As part of the service-provision process, IATA stated that it would use its clearing house fee-collection mechanism to bill monitored operators on behalf of the selected GMU service-provider and forward receipts to the service-provider. The fee collection mechanism provided by IATA has been in place since that time and, based on IATA updates at subsequent RVSM/TF meetings, appears to be working satisfactorily.

Payment for Monitoring Services

4.7   As noted above, IATA arranges for collection of the fee, which the service-provider charges an operator. That fee is fixed according to a price schedule agreed by the IATA RCG during a private-sector competitive selection process.

4.8   The meeting noted that the IATA fee collection system could be the mechanism for directly charging operators for the provision of monitoring services associated with airspace changes to be adopted in the Asia/Pacific Region. As noted previously, the APASM/TF envisions that the RASMA/SG as a sub-group of the APANPIRG would act in advisory role to States and, by extension, to groups of States operating under regional agreements. Aspects of this advisory role could consist of evaluating a proposed monitoring organization with respect to two questions analogous to those which IATA posed to the Technical Center.

4.9   Also, a means for establishing the validity of a monitoring organization's annual charges could be judged by the IATA RCG, with that judgement aided by RASMA/SG's endorsement of the organization's competence and by RASMA/SG's assertion that the organization's activities are a necessary contribution to fulfilling regional monitoring needs.

4.10   It is expected that the respective States and international organizations would directly finance the participation of the members of the RASMA/SG. Through the IATA ATC Enhancement and Finance (ATCE & F) service, direct financing for sub-contracted services would be provided based on a "fee for service" basis. To avoid multiple charging for inter-regional traffic, collection would be modeled on a "per departure" basis for all traffic above FL 290.

Role of the RASMA/SG

4.11   As envisaged, RASMA/SG membership would consist of specialists fully aware of both the ICAO requirements for monitoring in connection with airspace changes and also experienced in such monitoring activities. If the RASMA/SG deems that the answer to either of these questions (see 4.5) is negative, then it would not endorse the proposed monitoring organization. While, of course, this decision would not be binding on States or groups of States, such a finding could be of considerable assistance in helping States to decide on any proposed monitoring organization's suitability and need.

4.12   In this evaluative and advisory role, RASMA/SG judgements would be based on existing ICAO or Asia Pacific Regional material providing guidance about the need for monitoring and the establishment of a monitoring organization. In this regard, the RVSM regional monitoring agency handbook, being prepared under the auspices of ICAO's Separation and Airspace Safety Panel (SASP), scheduled for completion by the end of May 2003, should prove to be a valuable aid to judging an organization's competence. Similar handbooks addressing the roles and responsibilities of monitoring organizations in connection with horizontal-plane separation changes based on the introduction of required navigation performance (RNP) and in connection with data link, are being prepared by the APASM/TF. Once approved by the APANPIRG, these handbooks will likewise be valuable in judging a prospective monitoring organization's competence.

4.13   Since one of the RASMA/SG's roles would be dissemination of monitoring results on a region-wide basis, States will have ready access to safety-related information necessary to assist them in their safety oversight role. Since the results would have been produced by organizations judged competent to monitor, States would have confidence that such information is reliable and appropriate to support that safety oversight task.

4.14   Confirmation by RASMA/SG that a prospective monitoring organization would contribute to satisfying regional monitoring needs without duplication of effort, would provide both States and operators paying for such monitoring through user charges, the assurance that necessary monitoring is being done efficiently. Given its planned composition as a group of experienced monitoring specialists from the Region, RASMA/SG would be uniquely positioned within the Region to judge whether a proposed monitoring organization would be producing results which could already be obtained elsewhere. Because RASMA/SG would also be aware of the latest ICAO monitoring recommendations, States and operators could be confident that any increase or relaxation in monitoring requirements would be communicated throughout the Region in a timely manner. As a result, it should be possible for States and operators to have long-term assurance that monitoring will be done efficiently based on RASMA/SG advice.

4.15   A prospective monitoring organization could gain substantial benefit from operation of the RASMA/SG. If endorsed as competent and necessary, the organization would be in a favorable position to expect compensation for its services if such is required.

4.16   If a State were contemplating establishment of a monitoring organization because of a perceived need for safety-related information, the State could seek relevant RASMA/SG advice. Such advice

could be in regard to the competence which the State should ensure is inherent in its monitoring activities in order to collect valid information. Of potentially even more use would be RASMA/SG advice as to whether such information was already available elsewhere. Such a situation might arise if a State were concerned about the height-keeping performance of aircraft in its sovereign airspace where the RVSM is applied. Through its connection with the RVSM regional monitoring agencies within the Region, the RASMA/SG could facilitate transfer of global monitoring results which the State could take into account in reaching a decision about whether to establish a height-keeping performance monitoring function within its airspace.

Operators using the airspace of the Asia Pacific Region and the RASMA/SG

4.17   The intent of any monitoring program implemented as the result of an airspace change is to collect and analyze information relevant to the continued safety of that change. Such information may address safety directly, as in the case of height-keeping performance in connection with use of the RVSM, or indirectly through examination of the performance of a new system or procedure, as in the case of controller pilot data link communication. In either case, the immediate benefit of monitoring is to support maintenance of a safe level of system operation when a change is made.

4.18   The relationship of monitoring and economic benefit is indirect, in that monitoring is a requirement with economically beneficial changes such as application of the RVSM. In itself, monitoring does not result in reduced fuel burn or transit time, nor does it reduce controller workload. Rather, monitoring enables continued use of beneficial change.

4.19   Given that monitoring is being done competently and with sufficient scope, the relevant economic concern is whether or not monitoring is being done efficiently. That is, the question is whether or not only that monitoring is being done, which is necessary to support safe system operation, after an airspace change is made.

4.20   Further, given its proposed region-wide view of monitoring activities and intended connection with activity within ICAO and other regions, the RASMA/SG would be uniquely positioned within the Asia Pacific Region to judge the efficiency of the ensemble of monitoring activities. Airspace users deriving the benefits of airspace changes would, thus, have a basis for agreeing to contribute to recovery of a monitoring organization's costs, should such offset be necessary, if the RASMA/SG were to endorse the organization's efforts as necessary to support overall regional monitoring needs. An accompanying RASMA/SG endorsement of competence could also provide some assurance that the organization is carrying out its monitoring activities in an efficient manner.

4.21   The meeting recognized the process described above established by IATA and APARMO to select and to fund contracted monitoring services, and agreed that this was a suitable model for adoption by the RASMA/SG to assist with the setting up of such financing arrangements.

Agenda Item 5:   Report to APANPIRG/14

5.1   The meeting prepared a draft report to APANPIRG/14, which would be further developed by correspondence and presented by the Task Force Chairperson to the ATS/AIS/SAR/SG meeting to be held from 23-27 June 2003 at the Regional Office, Bangkok. The Chairperson advised the meeting that he would not be able to attend that meeting and invited the past Chairperson who would be attending to present the report. The meeting agreed to this arrangement.

5.2   The meeting in discussion considered issues on the functioning of the Sub-Group. It was noted that the Sub-Group may require several early meetings to establish its working practices. The meeting felt that early in the Sub-Group's activities, a meeting with representatives of the RMAs on their monitoring activities would be desirable. The meeting drew attention to a need to provide detailed guidance on how to set up a monitoring agency requiring external funding. In this regard, detailed guidance on funding would need to be developed. The meeting noted that since the Annex 11 provisions on safety systems management, many States require assistance to set up and operate theses systems. The meeting emphasized the important of ICAO providing training, seminars, workshops and guidance material. In this regard, the meeting noted that safety managements systems are the foundation on which a State builds its airspace safety monitoring activities, and for these to be effective, appropriate ICAO guidance is required. The meeting suggested that the RASMA/SG should give these matters priority in establishing its work programme.

Agenda Item 6:   Review the action plan

6.1   The meeting reviewed the action plan and agreed that the majority of items had been completed, a number of items are covered by the TORs, and the remainder would be completed by correspondence prior to APANPIRG/14. The revised action plan is contained in **Appendix H**.

Agenda Item 7:   Future Work – Meeting Schedule

7.1   The APASM Task Force final report will be completed by correspondence and presented to APANPIRG/14. The Task Force will also report progress to the contributing Sub-Groups of APANPIRG. In light of the foregoing, the meeting agreed that the Task Force did not require a further meeting.

7.2   In view of the Task Force having fulfilled its TORs established by APANPIRG/12, Conclusion 12/44 and as revised by APANPIRG/13, Conclusion 13/45 refers, the meeting agreed to recommend to APANPIRG/14 that the APASM/TF be dissolved.

7.3   In light of the above, the meeting developed a draft Decision to APANPIRG/14 as follows:

> **Draft Decision 14/xx – To dissolve the Asia/Pacific Airspace Safety Monitoring
> Task Force**
>
> That, the Asia/Pacific Airspace Safety Monitoring Task Force having completed its work programme, the Task Force be dissolved.

Agenda Item 8:   Other business

8.1   The meeting was informed by Japan of progress made by the Japan Civil Aviation Bureau to develop a structure for RVSM airspace safety monitoring for implementation of RVSM in Japanese domestic airspace. The meeting was advised that the total number of IFR traffic in the Japanese domestic airspace was approximately 2,000,000 per year. The Japanese domestic airspace was small in area and traffic congestion was a major problem leading to inefficient aircraft operations and daily delays. Implementation of RVSM in the domestic airspace of Japan would alleviate traffic problems. On 24 February 2000, RVSM had been implemented in the international airspace of Tokyo and Naha FIRs at the same time as implementation in other FIRs in the Pacific Airspace.

8.2   The meeting was also advised that discussions are underway with the Korean Civil Aviation Bureau to simultaneously implement RVSM in the Incheon FIR, and development of a joint implementations programme is underway, which will be coordinated with the ICAO RVSM/TF. The implementation date is planned for 2005. The meeting noted the information.

9.   Closing of the meeting

9.1   The Chairperson thanked the FAA and staff of CSSI for the excellent support provided, which contributed to the success of the meeting. The efforts of participants were highly appreciated in dealing with issues that had proved to be more complex than originally envisaged. The development of two new handbooks for RNP and ATS data link monitoring would be of considerable assistance to States in the region and globally to set up and operate airspace safety monitoring services. Further, the establishment of a Sub-Group to advise States on airspace safety monitoring matters would significantly contribute to the efficiency and efficacy of the provision of these services. The RASMA/SG also would have expertise available to States to assist them in meeting their airspace safety monitoring obligations. The Chairperson and on behalf of his predecessor from the FAA who was instrumental in the establishment of the Task Force and initiating the work programme, expressed his appreciation to participants and their organizations for their dedicated commitment to the Task Force work that enabled the work programme to be completed on time.

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LIST OF WORKING PAPERS (WPS) and INFORMATION PAPERS (IPS)

WORKING PAPERS

WP No.	Date	Agenda Item	Presented by	Subject
1	24/02/03	1	Secretariat	Provisional Agenda
2	5/05/03	4	United States	Previous Guidance On Financial Arrangements For A Asia Pacific Regional Airspace Safety Monitoring Agency
3	5/05/03	3	United States	Establishment Of The Asia Pacific Airspace Safety Advisory Group (APASAG) As A Sub-Group To The Asia Pacific Air Navigation Planning And Implementation Regional Group
4	5/05/03	4	United States	Funding Asia Pacific Airspace Safety Monitoring: Some Possibly Relevant Experience From The Asia Pacific Reduced Vertical Separation Minimum Implementation Program
5	28/4/03	3	IATA	Development of the Organization and Structure of APASAG
6	28/4/03	4	IATA	Funding Requirements
7	5/05/03	3	Japan	Proposed Activity of Central Reporting Agency of Japan for ATS Data Link Monitoring in East and Southeast Asia Airspace
8			Withdrawn	
9	5/05/03	6	Secretariat	APASM Task Force Action Plan
10	5/06/03	2	Japan and United States	Draft Guidance Material for End-To-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems

INFORMATION PAPERS

IP No.	Date	Agenda Item	Presented by	Subject
1	5/05/03	1	Secretariat	Order of Business
2	5/05/03	4	Japan	Current Cost For ATS Data Link Monitoring Activities of CRA of Japan
3	5/05/03	8	Japan	Progress Report on Building the Structure for RVSM Airspace Safety Monitoring in the Japanese Domestic Airspace

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DRAFT

GUIDANCE MATERIAL FOR
END-TO-END SAFETY AND PERFORMANCE MONITORING OF
AIR TRAFFIC SERVICE (ATS) DATA LINK SYSTEMS

IN THE ASIA/PACIFIC REGION

Version 1.0

5 May 2003

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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 ATN, 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.

```
PROBLEM          REQUEST LOG FROM
REPORT     ──►   DATALINK SERVICE      ──────────►         [building]
                 PROVIDERS

                                                     ARINC/SITA/AVICOM/ETC.
           ANALYZE/DECODE LOG    ◄──────────────────
                   │
                   ▼
           CORRELATE WITH
           REPORT
                   │
                   ▼
   DETERMINE PROBABLE        ENTER IN PR        STAKEHOLDER
   CAUSE/ASSIGN TO    ──►    DATABASE    ──►    CREATES FIX AND/OR
   STAKEHOLDER                                  WORKAROUND


   FIT WEB SITE    ◄──────      [database]    ◄──────   FIT REVIEW
                                                        PROCESS
```
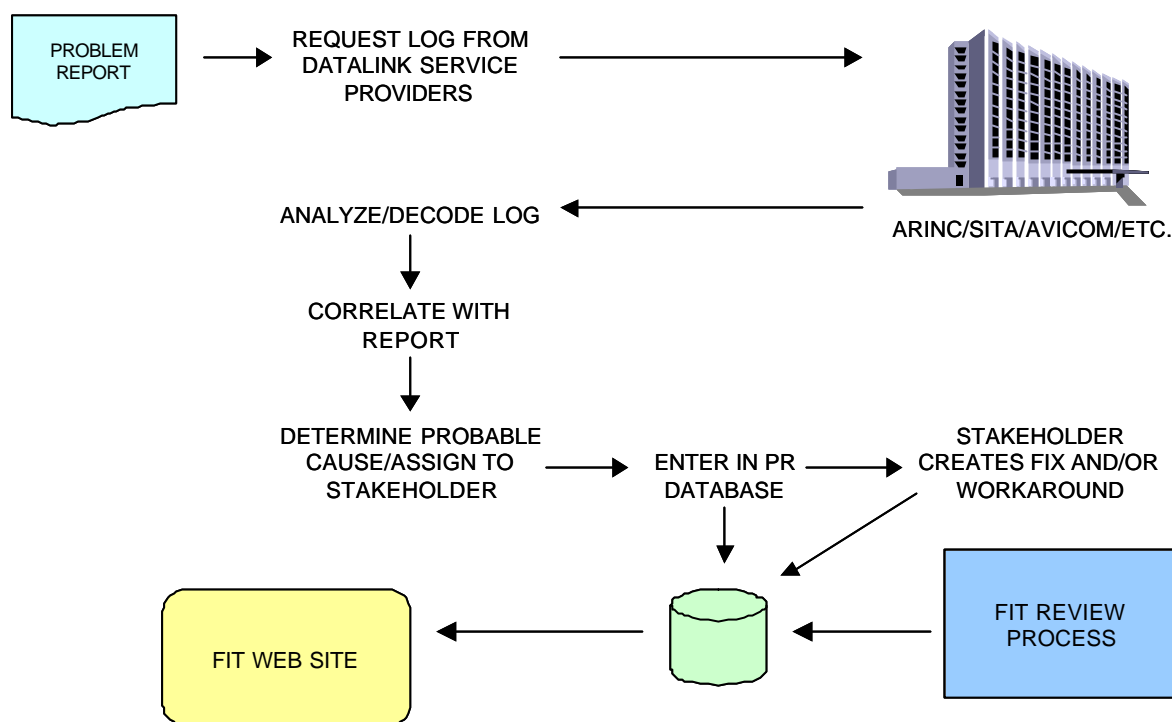
6.2.2   The problem identification task begins with receipt of a report from a stakeholder, usually an operator, ATS provider or communication service provider. If the person reporting the problem has used the problem reporting form provided in the appropriate regional manual, then data collection can 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).

7.   (Air traffic Services Interfacility Data Communication (AIDC) material to be developed)

DRAFT TERMS OF REFERENCE

Regional Airspace Safety Monitoring Advisory Sub Group
(RASMA/SG)

Terms of Reference of the RASMA/SG
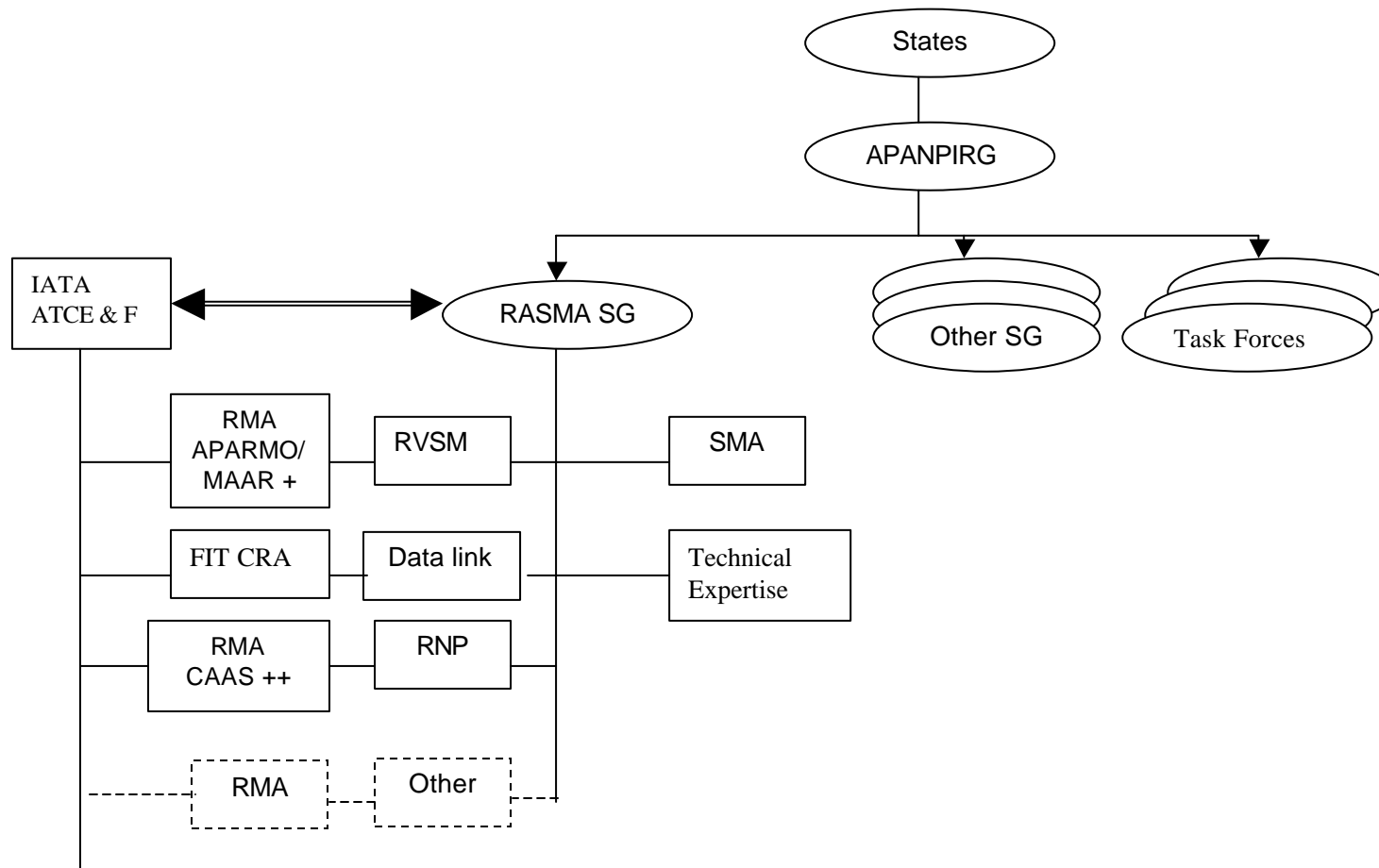
The objectives of the Sub-Group are to:

a)   foster safe implementation of CNS/ATM initiatives within the Asia Pacific Region; and

b)   to confirm that the established levels of airspace safety are met for the Asia/Pacific Region.

To meet these objectives the Sub-Group shall:

a)   review airspace safety performance in the Asia/Pacific Region at the regional level and within international airspace;

b)   review and develop as necessary guidance material for airspace safety monitoring, assessment and reporting activities;

c)   recommend and facilitate the implementation of airspace safety monitoring and performance assessment services;

d)   review and recommend on the competency and compatibility of monitoring organizations;

e)   review, coordinate and harmonise regional and inter-regional airspace safety monitoring activities;

f)   review regional and global airspace planning and developments in order to anticipate requirements for airspace safety monitoring and assessment activities;

g)   address other airspace safety related issues as necessary;

h)   facilitate the distribution of safety related information to States, and

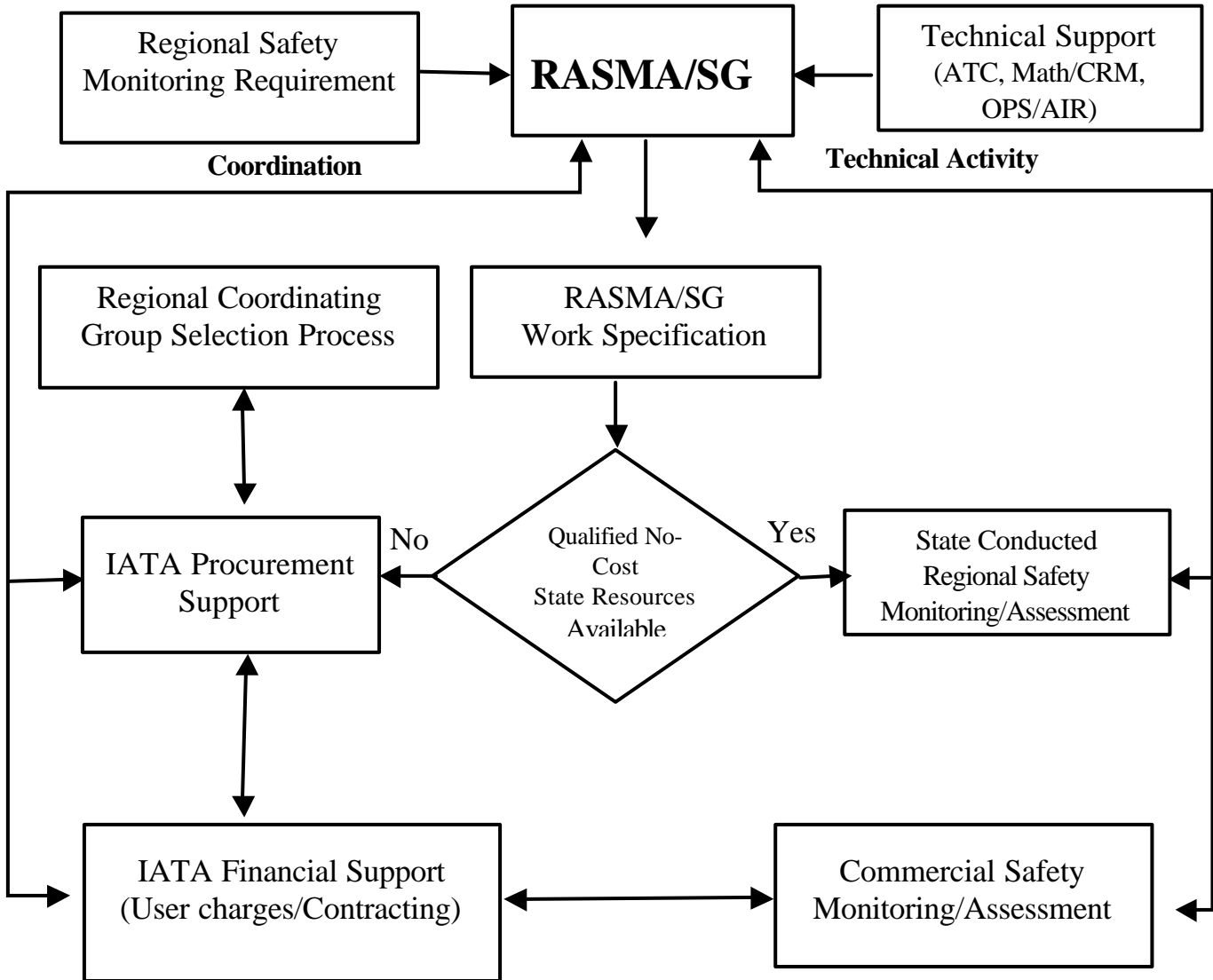i)   provide to APANPIRG comprehensive reports on regional airspace safety monitoring activities.

DRAFT ORGANIZATIONAL STRUCTURE FOR THE RASMA/SG

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                              ┌─────────┐
                              │ States  │
                              └────┬────┘
                                   │
                              ┌─────────┐
                              │APANPIRG │
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              ┌────────────────────┼────────────────┬──────────────┐
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    │ IATA     │◄══════════►│  RASMA SG  │     │ Other SG │   │Task Forces│
    │ ATCE & F │            └─────┬──────┘     └──────────┘   └──────────┘
    └────┬─────┘                  │
         │     ┌──────────┐ ┌──────────┐      ┌──────────┐
         ├─────│  RMA     │─│  RVSM    │      │   SMA    │
         │     │ APARMO/  │ └──────────┘      └──────────┘
         │     │ MAAR +   │
         │     └──────────┘
         │     ┌──────────┐ ┌──────────┐      ┌──────────┐
         ├─────│ FIT CRA  │─│ Data link│      │Technical │
         │     └──────────┘ └──────────┘      │Expertise │
         │                                    └──────────┘
         │     ┌──────────┐ ┌──────────┐
         ├─────│  RMA     │─│   RNP    │
         │     │ CAAS ++  │ └──────────┘
         │     └──────────┘
         │     ┌ ─ ─ ─ ─ ┐ ┌ ─ ─ ─ ─ ┐
         └ ─ ─ │  RMA    │ │  Other  │ ─ ─
               └ ─ ─ ─ ─ ┘ └ ─ ─ ─ ─ ┘
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Note: *+   to take over from APARMO subject to APANPIRG/14*
          ++   there are others

DRAFT RASMA/SG Work Flow

Regional Safety Monitoring Requirement	**RASMA/SG**	Technical Support (ATC, Math/CRM, OPS/AIR)

Coordination   **Technical Activity**

Regional Coordinating Group Selection Process	RASMA/SG Work Specification	

No   Qualified No-Cost State Resources Available   Yes

IATA Procurement Support		State Conducted Regional Safety Monitoring/Assessment

IATA Financial Support (User charges/Contracting)	Commercial Safety Monitoring/Assessment

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PLAN FOR THE
REGIONAL AIRSPACE SAFETY MONITORING ADVISORY
SUB-GROUP (RASMA/SG)

Prepared by the
APASM Task Force

7 May 2003

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1. INTRODUCTION

1.1   The concept of establishing a regional airspace safety monitoring agency was first addressed at the Eighth Meeting of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) Communications, Navigation, Surveillance and Air Traffic Management Implementation Co-ordination Sub-Group (CNS/ATM/IC/SG/8), held in Bangkok, Thailand, 30 July to 3 August 2001. The Twelfth Meeting of the APANPIRG, held in Bangkok, Thailand, 20 – 24 August 2001 discussed the arrangements necessary to meet the safety requirements for future regional airspace planning, implementation and operation of reduced separation minima, communications, navigation, surveillance and air traffic management (CNS/ATM) systems and related airspace changes.

1.2   Many States and organizations have been undertaking airspace safety monitoring activities in the Asia Pacific (APAC) Region, resulting in a technological and geographical diversity of the necessary safety monitoring organizational scenarios. APANPIRG recognized that it was necessary to give priority to examining in detail the necessary arrangements to establish an appropriate regional airspace safety monitoring structure and funding mechanism to centralize and harmonize the various monitoring activities. To undertake this work, APANPIRG/12, under Conclusion 12/44, established the Asia Pacific Airspace Safety Monitoring Task Force (APASM/TF).

1.3   The APASM/TF considered various arrangements to establish a regional airspace safety monitoring structure and to centralize monitoring activities. The Task Force recognized that States are responsible for the safety of the airspace under their responsibility, and in accordance with the provisions of Annex 11, States are required to provide the necessary safety services including monitoring of the airspace. Within the APAC Region, airspace safety monitoring requirements and the establishment of airspace safety monitoring organizations are provided for under the APANPIRG implementation plans for application of reduced vertical separation minimum (RVSM) and ATS data link services. Accordingly, various States responsible for the international airspace in the APAC Region provide airspace safety monitoring services. It was further recognized that in the future, States would establish the necessary airspace safety monitoring services required for implementation of new separation standards and technologies.

1.4   The APASM/TF agreed that these State operated monitoring services required centralized coordination and harmonization. In order to ensure that agreed regional safety levels are being met on an ongoing basis, it was desirable to establish a body that could review and assess the results of the various airspace safety monitoring agencies and report this information to ICAO.

1.5   Without the cost-effective availability of airspace safety monitoring and evaluation services, the region may be unable to sustain the current pace of development of airspace efficiencies and communications services. These services form an essential part of the international airspace operational management and require adequate operational funding.

1.6   The APASM/TF initially developed a plan to establish a Regional Airspace Safety Monitoring Agency (RASMA), which would operate as a business entity fully funded by user charges, and under the authority of States, who would enter into a multi-national agreement to make use of RASMA services.

1.7   The APANPIRG/13 meeting in August 2002 reviewed progress to establish the RASMA. The meeting sought clarification on the role of RASMA in providing safety monitoring services vis á vis State responsibility for the airspace under its authority. It was emphasized that States using RASMA services would retain the authority over the airspace and decide whether or not they want to enter an arrangement with RASMA for airspace safety data collection and/or provision of assessment services. The meeting agreed to continue the work of the Task Force, who would make its recommendations for the establishment of a regional airspace safety monitoring organization and funding arrangement to APANPIR/14 in August 2003.

1.8   During the course of its work, the APASM/TF considered that the institutional difficulties to form the RASMA as a business entity were too complex, and a number of States, for legal reasons, would

have difficulty in making use of RASMA services. Further, existing airspace safety monitoring arrangements put in place by States in support of airspace implementation planning, were operating satisfactorily, and there was no need to incorporate these activities in RASMA. However, there was a need to coordinate and harmonize airspace safety monitoring activities on a regional and inter-regional basis, as well as to provide a common means of funding. Accordingly, a permanent body of experts to periodically review and evaluate the results of airspace safety monitoring would significantly enhance the airspace safety monitoring process.

1.9   The APASM/TF considered that a change was needed in the structure of the body from a business entity to a Sub-group of APANPIRG. As a Sub-group operating within the ICAO system, this would facilitate State participation and contribute to improving the SARPs, PANS and ICAO guidance material on operational safety matters. It was further considered that it was highly desirable to have expertise readily available to States to assist them meet their Annex 11 safety obligations. This body would be structured as an APANPIRG sub-group in accordance with the *APANPIRG Procedural Handbook*, and would be known as the Regional Airspace Safety Monitoring Advisory Sub-Group (RASMA/SG).

1.10   Under the APANPIRG RVSM implementation programme, aircraft height-keeping performance monitoring services have been established on a "user pays" basis. In addition, airspace data collection, analysis and safety risk assessments have been carried out for the region using human and technical resources provided by some States and organizations at no cost to the user. In the future, some of these States and organizations would continue to provide the resources to meet airspace safety monitoring and assessment obligations. However, in some cases, these services would be supported through a user charges levy based on a unit cost per flight. Funding arrangements making use of the established IATA collection system have already been successfully used to fund RVSM monitoring activities in the region. This approach is recommended as it could readily be expanded to meet other monitoring requirements and provide an effective means to directly fund the monitoring agencies.

1.11   The establishment of the RASMA/SG will ensure that a group of multi-disciplinary experts will be permanently available to advise APANPIRG and States on airspace safety matters. The provision of funding arrangements is expected to meet the APANPIRG requirements, and for the foreseeable future will ensure that the Asia Pacific Region has in place a robust and cost effective means to meet the ICAO airspace safety monitoring requirements.

2.   EXISTING MONITORING SERVICES

2.1   Within the Asia Pacific Region action has been taken under various ICAO Task Forces to oversee airspace operations and safety. With respect to the implementation of reduced horizontal and vertical separation minima, the monitoring requirements are been carried out by several different organizations. The United States Federal Aviation Administration (FAA) currently performs the functions of the Asia Pacific Approvals Registry and Monitoring Organization (APARMO) established for RVSM implementation in the Pacific Region. In addition, the FAA has provided airspace safety assessments and oversight for the implementation of both vertical and lateral separation minima in various parts of the region. Airservices Australia provides safety assessment services to States and ATS providers through agreements between States, such as the Informal South Pacific ATS Co-ordinating Group (ISPACG), and in support of airspace changes in the South China Sea and the Bay of Bengal. The Civil Aviation Authority of Singapore provides monitoring services for required navigation performance (RNP) operations on the South China Sea ATS route structure. AEROTHAI of Thailand has established the Monitoring Agency for the Asia Region (MAAR) as agreed by APANPIRG to take over responsibility of RVSM monitoring in the Asia Region from the APARMO. Other States, such as India and Japan are establishing national monitoring programmes and indicated their willingness to provide regional or sub-regional airspace safety monitoring services.

2.3   Additionally, considerable experience has been gained in the system performance monitoring and enhancement of ATS data link equipment and procedures used to provide communications for air traffic control services and aircraft operators. The States that are signatories to ISPACG and the Informal Pacific

ATC Co-ordination Group (IPACG) have carried out this function co-operatively by their respective central reporting agencies (CRAs) and FANS Interoperability Teams (FITs). In addition, the FANS Action Team – Bay of Bengal (FATBOB), has been established by ICAO for the Bay of Bengal area, and a similar arrangement is under consideration for the South China Sea area.

3. SAFETY FOCUS

3.1 Provision for the establishment of ATS safety management programmes is mandated by ICAO Annex 11 to the Convention on International Civil Aviation. As stated in Annex 11, Section 2.26 – ATS Safety Management: *States shall implement systematic and appropriate safety management programmes to ensure that safety is maintained in the provision of ATS within airspaces and at aerodromes.* Further, Annex 11 requires that, *as of 27 November 2003, the acceptable level of safety and safety objectives applicable to the provisions of ATS within airspace and at aerodromes shall be established by the State or States concerned.* When applicable, safety levels and safety objectives should be established on the basis of regional air navigation agreements. Procedures for ATS safety management are contained in the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444, Chapter 2).

Safety Goals

3.2 Information on establishing a target level of safety (TLS) of 5×10^{-9} fatal accidents per flight hour per dimension for en-route systems is contained in Annex 11, Attachment B-2. The APANPIRG/12 meeting (Conclusion 12/41) established this TLS for en-route systems in the Asia Pacific Region where a TLS is required for implementation of separation minima. The RASMA/SG would, as one of its primary objectives, examine the results of the monitoring activities in the Asia Pacific Region to ensure that the established safety goal for the airspace is being achieved.

Methodology for Assessing Risk

3.3 It is the responsibility of States to ensure that established safety levels are being met on a continuing basis in accordance with ICAO provisions. To assist in achieving this, it is necessary to estimate risk and then compare it to the applicable safety goal. It is proposed that the RASMA/SG could assist States in achieving this objective. Because the safety assessment methodology will be applied to separation reduction implementations, CNS/ATM applications and other programs that have global application, it is necessary to use an established method to assess risk in a manner consistent with other ICAO regions. Hence, the risk assessment must be carried out using an ICAO accepted methodology.

4. ESTABLISHMENT OF A SUB GROUP TO APANPIRG

4.1 The RASMA/SG will be formed as a Sub Group of APANPIRG in accordance with the *APANPIRG Procedural Handbook*. The RASMA/SG would obtain and exchange information from States, ATS providers, regulatory authorities, aircraft operators, and monitoring agencies in other ICAO regions.

5.   TERMS OF REFERENCE

5.1   The Terms of Reference of the RASMA/SG are contained in Appendix x.

6.   MEMBERSHIP OF RASMA/SG

6.1   It is envisaged that in order to provide an effective role, the membership to the RASMA/SG would be for a fixed term from those States that have extensive experience in conducting airspace safety monitoring and safety analysis.

7.   DESCRIPTION OF THE RASMA/SG PROCESS

7.1   A functional description of the RASMA/SG process showing the structure and linkages is attached as Appendix F.

8.   FINANCING

8.1   The region has, on a collective basis, already been successful in establishing aircraft height-keeping performance monitoring services on a "user pays" basis. In addition, airspace data collection, analysis and safety risk assessments have been carried out for the region using human and technical resources provided by some States and organizations at no cost to the user. These donated resources will continue to be used to the extent that they are available.

Financial Arrangements

8.2   Operating charges to airlines will be based on each aircraft movement originating from/within the APAC Region. Liaison will also be necessary with those States outside the APAC Region where flights terminate to avoid multiple charging, particularly for long-haul flights. The provision of safety monitoring services will need to be cost effective to the industry as a whole.

Funding Resources

8.3   It is recognised that the cost of many of these safety monitoring and assessment services will need to be recovered either directly or indirectly from the users of the airspace in accordance with ICAO provisions. The necessary resources to fund State safety monitoring obligations may be provided in the following ways:

a)   Direct payment: Funds from State civil aviation authorities, air navigation service providers, air transport operators, air-to-ground communications service providers, aircraft manufacturers; and

b)   Indirect payment: Provision of technical services and human resources provided in-kind by any entity.

8.4   Where funds are provided by direct payment, the preferred collection mechanism would be through a direct levy on the airlines to be collected by IATA.

9.   STAKEHOLDER CONSIDERATIONS

9.1   Stakeholders comprise a cross section of the aviation community from the air traffic service providers and airspace users through to the communications service providers. Their needs are diverse but all have a safety obligation to meet international standards and recommended practices. The establishment of a dedicated permanent regional airspace safety oversight body centralises these activities.

9.2   The stakeholders are a diverse group with a common interest in the output of the airspace safety monitoring process in terms of the safety assurance. The stakeholders are:

    a)   States of the APAC Region;

    b)   Aircraft operators;

    c)   International organizations representing their aircraft operators, flight crews and public safety, and

    d)   Other service providers within the airspace, such as communications service providers and other service industry related companies, who will also be beneficiaries of the APASAG.

9.3   The stakeholders require airspace safety monitoring and safety assessment services to continue the development and improvement of the regional airspace, while providing a safe and efficient environment for aircraft operators. It is essential that the Asia Pacific Region have in place a transparent airspace safety oversight capability to which all States contribute and participate. These are best achieved for international airspace through ICAO and its contributing bodies.

ID	Description	Start	Finish	Resource Names
1	**Clearly describe airspace safety monitoring requirements in accordance with ICAO provisions**	12-Dec-01	5-May-03	Task Force
1a	Follow the development of ICAO Separation and Airspace Safety Panel guidance as it relates to RVSM regional monitoring agencies	12-Dec-01	Draft 14Jun03 Final 1 JUL03	Task Force
~~1b~~	~~Send State letter to identify States wishing to enter into arrangements for airspace safety monitoring and/or safety assessment services~~	~~12-Dec-01~~	~~1-Mar-03~~	~~ICAO~~
1c	Develop handbook detailing requirements for horizontal monitoring including State responsibility for providing data	12-Dec-02	Draft 14Jun03 Final 1 JUL03	Australia, US, Singapore
1d	Develop handbook detailing requirements for communications/surveillance system monitoring including State responsibility for providing data	12-Dec-02	Draft 14Jun03 Final 1 JUL03	Japan, US, Boeing
2	**Develop the organization and structure of an airspace safety monitoring organization for the Asia/Pacific Region**	12-Dec-01	5-May-03	Task Force
2a	Develop the RASMA TF plan for the establishment of an airspace safety monitoring organization	14-Dec-01	5-May-03	Task Force, Drafting Group
~~2b~~	~~Consider organizational models and provide comments to support a decision~~	~~12-Dec-02~~	~~5-May-03~~	~~Task Force~~
~~2c~~	~~Specify procedures for selecting Core Team and APASAG staff~~	~~13-Sep-02~~	~~5-May-03~~	~~Task Force~~
3	**Identify the cost of operating monitoring services and a system for its funding**	14-Dec-01	5-May-03	Task Force
~~3a~~	~~Obtain information on the cost of performing current monitoring services~~	~~14-Dec-01~~	~~5-May-03~~	~~Boeing, Japan, US~~
~~3b~~	~~Determine funding requirements~~	~~12-Dec-02~~	~~5-May-03~~	~~Task Force, Drafting Group~~
3c	Propose a recommended funding arrangement	12-Dec-02	9-Jun-03	Task Force
~~3d~~	~~Financial drafting group to take into consideration that inter-regional harmonization of charging for monitoring services is equitable~~	~~14-Dec-01~~	Referred	Included in TORs of RASMA SG
~~3e~~	~~Examine information to determine an appropriate level of cost recovery for airspace safety monitoring in APAC~~	~~13-Sep-02~~	~~5-May-03~~	To be completed as part of Item 3C

ID	Description	Start	Finish	Resource Names
4	**Identify airspace safety monitoring and assessment resources**	14-Dec-01	5-May-03	Task Force
4a	~~Encourage current States/agencies providing airspace safety monitoring services to share technology and information~~	~~14-Dec-01~~	Referred	Included in TORs of RASMA SG
4b	~~Provide information on India's height monitoring equipment plans~~	~~12-Dec-02~~	~~24-Feb-03~~	~~India~~
5	**RASMA TF implementation issues**			
5a	~~Identify States/agencies available to provide airspace safety monitoring and assessment services~~	~~13-Sep-02~~	~~5-May-03~~	~~Task Force~~
5b	~~Determine responsibility and coverage of monitoring agencies (regional, by State, by function, or major traffic flow)~~	~~13-Sep-02~~	~~5-May-03~~	~~Task Force~~
5c	~~Determine need for additional States/agencies to provide airspace safety monitoring and assessment services~~	~~12-Dec-02~~	~~5-May-03~~	~~Task Force~~
5d	~~Provide to the financial drafting group sample format and examples of contracts currently in use for airspace safety monitoring services~~	~~12-Dec-02~~	~~1-Apr-03~~	~~Japan, US, Boeing~~
6	~~**Prepare an appropriate amendment to the Asia Pacific Regional Air Navigation Plan for the establishment of APASAG**~~	~~13-Sep-02~~	~~5-May-03~~	~~Task Force Chairperson, US, ICAO~~
7	**Report progress**			
7a	Report progress to ATS/AIS/SAR/SG/13	24-Feb-03	23-Jun-03	Representative of Task Force Chairperson
7b	Report progress to CNS/ATM/IC/SG/10	24-Feb-03	15-Jul-03	Task Force Chairperson
7c	Report progress to CNS/MET/SG/7	24-Feb-03	15-Jul-03	Task Force Chairperson
8	**Report to APANPIRG/14**	5-May-03	4-Aug-03	Task Force Chairperson

? END?