



**Thirteenth Meeting of the Asia/Pacific Air Navigation Planning
and Implementation Regional Group (APANPIRG/13)**

Bangkok, Thailand, 9 to 13 September 2002

Agenda Item 3: CNS/ATM Implementation and Related Activities

ESTABLISHMENT OF A REGIONAL AIRSPACE SAFETY MONITORING AGENCY

(Presented by the Secretariat)

SUMMARY

This working paper presents the report of the Asia Pacific Airspace Safety Monitoring Task Force (APASM/TF), which completed its work programme and recommended the establishment of a regional airspace safety monitoring agency for the Asia Pacific Region.

1. INTRODUCTION

1.1 The twelfth meeting of the Asia Pacific Planning and Implementation Regional Group (APANPIRG/12) Decision 12/44 established the Asia Pacific Airspace Monitoring Task Force (APASM/TF) to develop an airspace safety system performance monitoring structure for the Asia/Pacific Region.

1.2 The Task Force was made up of members from the following States and international organizations: Australia, Fiji, Japan, India, Singapore, Thailand, United States (Chairperson), Chairpersons of the ATS/AIS/SAR/SG, CNS/ATM/IC/SG, CNS/MET/SG, Secretary from the Asia/Pacific Regional Office and the International Airline Transport Association (IATA).

1.3 The Task Force held three meetings and one working group meeting at the Asia/Pacific Regional Office, Bangkok as follows: APASM/TF/1, 12-14 December 2001; APASM/TF/2, 5-8 March 2002; APASM/TF/3, 22-24 July 2002; and APASM/WG, 21-23 August 2002. The report of the APASM/TF is provided at Appendix A.

2. DISCUSSION

2.1 The Task Force completed its work programme set by APANPIRG/12 at the APASM/TF/WG meeting (21-23 August) and finalized a plan (Attachment to the Report of the APASM/TF at Appendix B) for the establishment of a regional airspace safety monitoring agency for the Asia/Pacific Region. The plan was developed following a business plan approach and included financial arrangements for funding the cost of operating the monitoring agency. The Task Force proposed that the monitoring agency should be named the Regional Airspace Safety Monitoring Agency – Asia Pacific (RASMA – APAC, hereafter referred to as RASMA).

2.2 It should be noted that Annex 11, Chapter 2, paragraph 2.26.2 requires inter alia: “*as of 27 November 2003, the acceptable level of safety and safety objectives applicable to the provision of within airspaces and at aerodromes shall be established by the State or States concerned*”. In this regard, some States do not have the mechanism in place to undertake airspace safety monitoring and to conduct safety assessments. In the view of the Task Force, it would be more efficient and cost effective to have a regional agency handle the necessary airspace safety monitoring arrangements and coordination functions on behalf of those States requiring assistance. This would ensure that safety requirements would be met in accordance with Annex 11.

2.3 In view of the Annex 11 applicability date of 27 November 2003 and the implementation of significant airspace changes in the Region, such as the EMARSSH project on 28 November 2002 and on going implementation of RVSM, the establishment RASMA would provide essential support to States to meet their safety obligations.

2.4 The APASM/TF recognized that detailed work necessary to implement the RASMA still needs to be developed. Nevertheless, in order to complete this work, it is suggested that the meeting indicate the priority to establish the RASMA. This would enable States and international organizations to commit the necessary resources to completing the work of the Task Force.

3. CONCLUSION

3.1 The Task Force recommended in its report that the Regional Airspace Safety Monitoring Agency (RASMA) should be established for the Asia/Pacific Region. It was recognized by the Task Force that the work necessary to implement the RASMA could not be completed in time for the APNAPIRG/13 meeting. In order to complete this work, the meeting should indicate to States and International organizations supporting the work of the Task Force that there is a requirement for the RASMA and it should be implemented as soon as practicable.

3.2 In light of the above, the APASM/TF terms of reference should be reviewed to include implementation issues. A list of activities necessary to implement RASMA are contained in the Report of the APASM/TF (Appendix A, paragraph 9), which should be taken into account. Also, the development of detailed requirements for implementation and completion of the Plan would require expertise not presently available to the Task Force such, as legal and financial. Therefore, the composition of the Task Force should be reviewed.

4. ACTION BY APANPIRG/13

4.1 Taking into account the provisions in Annex 11 in respect to airspace safety management, and the applicability date of 27 November 2003 mentioned in paragraph 2.2 above, the meeting is invited to:

- a) note the report of the APASM/TF (Appendix A) and the attached Plan for the Establishment of an Asia Pacific Regional Airspace Safety Monitoring Agency (RASMA);
- b) establish a priority for completing the work of the Task Force based on the Plan developed by the APASM/TF;
- c) agree that there is an urgent requirement to establish the RASMA to assist States to provide the necessary airspace safety monitoring services in accordance with Annex 11;

- d) continue the work of the APASM/TF to complete the development of detailed requirements for the establishment and implementation of the RASMA as soon as practicable;
- e) review the terms of reference and composition of the APASM/TF taking into account the report of APASM/TF (Appendix A, paragraph 9); and
- f) request ICAO to carry out a thorough review of the Plan and report to APANPIRG.

INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

APPENDIX A



**Report of the Asia Pacific Airspace Safety Management
Task Force
to the 13th Meeting of the
Asia Pacific Air Navigation Planning and Implementation
Regional Group**

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

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

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1 HISTORY OF THE TASK FORCE

Introduction

1.1 Decision 12/44 taken by the Twelfth Meeting of the Asia/Pacific Planning and Implementation Region Group (APANPIRG/12) established the Asia/Pacific Airspace Safety Monitoring Task Force (APASM/TF). The decision was:

Decision 12/44 – Establishment of a Task Force to Develop an Airspace Safety System Performance Monitoring Structure for the Asia/Pacific Region

That, a Task Force be established reporting to APANPIRG to develop an airspace safety system performance monitoring structure and funding mechanism for the Asia/Pacific Region in accordance with ICAO provisions. The composition, guiding principles and Terms of Reference of the Task Force are as shown in the Appendix B to the Report on Agenda Item 3.

Composition of the Asia/Pacific Region System Performance Monitoring Task Force

1.2 The Task Force members would be provided by the following States and International Organizations:

Member States:

Australia
Fiji
Japan
India
Thailand
Singapore
United States (Chairperson)

International Organizations:

International Air Transport Association (IATA)
International Air Line Pilots' Associations (IFALPA)
International Federation of Air Traffic Controllers Associations (IFATCA)

International Civil Aviation Organization (ICAO):

Chairperson of the ATS/AIS/SAR/SG
Chairperson of the CNS/ATM/IC/SG
Chairperson of the CNS/MET/SG
Secretary

Terms of Reference of the Asia/Pacific Region System Performance Monitoring Organization Task Force

1.3 The Draft Terms of Reference were as follows:

- To develop the organization and structure of a system performance monitoring organization for the Asia/Pacific Region, and to coordinate with other regional monitoring organizations to ensure inter-regional harmonization;

- To examine requirements of regulatory bodies, operators and service providers;
- To determine the size and functions of the monitoring services to meet safety goals;
- To identify the cost of operating monitoring services and requirements for its funding;
- To address any other matters as appropriate and relevant to establishing an appropriate monitoring system;
- The Task Force will include participation from all parties concerned; and
- The Task Force will report to the APANPIRG.

Guiding Principles

1.4 The following guiding principles were set:

- a) airspace safety oversight and system performance monitoring requirements to be established in accordance with ICAO provisions;
- b) all regional monitoring activities to be integrated in a regional monitoring structure under APANPIRG;
- c) a single monitoring agency to be established for an airspace or major traffic flow;
- d) States willing to undertake the management of a regional monitoring agency to be capable of providing appropriate support and expertise;
- e) the cost of providing monitoring services to be recovered from route charges and used in accordance with ICAO's policies on route charges; and
- f) with the expertise and appropriate resources to be encouraged to provide support and assistance to the regional safety programme.

Meetings of the Task Force

1.5 The Task Force met on three occasions with one further meeting of a working group of the Task Force. Each meeting was held at the Regional Office in Bangkok. The dates of the meetings were:

APASM TF/1	12 - 14 December 2001
APASM TF/2	5 – 8 March 2002
APASM TF/3	22 - 24 July 2002
APASM TF/WG	21 - 23 August 2002

1.6 The Task Force was chaired by Ms Leslie McCormick, Acting Deputy Manager ATS International Staff, United States Federal Aviation Administration.

1.7 Regional Officers ATM Messrs. John E. Richardson and David J. Moore served as Secretary for the meetings, assisted by other Regional Officers.

1.8 All discussions were conducted in English. Documentation was issued in English.

Reference Documents

- 1.9 The following documents were among those used for reference by the Task Force:
- a) Annex 11 to the International Convention on Civil Aviation - *Air Traffic Services*;
 - b) *Procedures for Air Navigation Services – Air Traffic Management*, (PANS-ATM, Doc 4444);
 - c) *Manual on Air Navigation Services Economics*, Doc 9161/3 - ICAO, Third Edition 1997;
 - d) Facilities and Services Implementation Document (FASID) Asia and Pacific Regions Doc 9673 – ICAO; and
 - e) Report of the Twelfth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/12), Bangkok, Thailand, 20-24 Aug 2001.

2 REVIEW OF TERMS OF REFERENCE AND GUIDING PRINCIPLES

2.1 The Task Force reviewed the draft Terms of Reference (TOR) and guiding principles established by APANPIRG/12. In regard to TOR a), the view was expressed that the organization and structure to be developed by the Task Force should have airspace safety as the primary focus. This would be in line with the provisions on ATS safety management in Annex 11, Chapter 2. These provisions require States to establish ATS safety management programmes, which shall provide for continuous monitoring and regular assessment of the safety level achieved.

2.2 It was noted that the original wording of the TOR limited the Task Force to establishing a “system performance monitoring organization”. It was suggested that the Task Force should establish an “airspace safety monitoring organization” which had a more focused application, and that this term would better reflect the work envisioned of a regional safety monitoring agency. In light of the foregoing, the meeting changed TOR a) and adopted the following TOR:

Revised Terms of Reference

- To develop an airspace safety monitoring organization and structure for the Asia/Pacific Region, and to coordinate with other regional monitoring organizations to ensure inter-regional harmonization;
- To examine requirements of regulatory bodies, operators and service providers;
- To determine the size and functions of the monitoring services to meet safety goals;
- To identify the cost of operating monitoring services and requirements for its funding;
- To address any other matters as appropriate and relevant to establishing an appropriate monitoring system;
- The Task Force will include participation from all parties concerned; and

- The Task Force will report to the APANPIRG.

3 PROVISION OF MULTINATIONAL FACILITIES AND SERVICES

3.1 The ASIA/PAC FASID provides general guidelines on the establishment and provision of a multinational ICAO ASIA/PAC air navigation facility/service. The FASID defines a multinational air navigation facility/service as:

“A facility/service specifically identified as such and included in the ICAO ASIA/PAC Regional Plan for the purpose of serving international air navigation in airspace extending beyond the air space serviced by a single State in accordance with the ASIA/PAC Regional Plan.”

3.2 An airspace safety monitoring organization for the ASIA/PAC Region fits this definition.

3.3 The FASID states that proposals for such a multi-national facility/service should be supported by material relating to the following aspects:

- a) Purpose of the proposal and operational and technical justifications;
- b) Financial implications and cost effectiveness;
- c) Managerial implications; and
- d) Alternative solutions

4 DEVELOPMENT OF PLAN

4.1 The Task Force developed a plan to establish the organisational structure and proposed method of funding a regional airspace safety monitoring organisation using a business plan approach. The *Plan for Establishment of an Asia Pacific Regional Airspace Safety Monitoring Agency* (RASMA) is presented at Attachment A. The plan should be read in conjunction with this report.

5 PURPOSE OF THE PROPOSAL AND OPERATIONAL AND TECHNICAL JUSTIFICATIONS

Organizational objectives

5.1 The initial objective is to provide a robust and functional management team to ensure that the services of the RASMA are provided to all regional airspace and safety authorities, air traffic service providers and aircraft operators, in an efficient and cost effective manner.

5.2 The agency objectives proposed for the RASMA are to:

- a) Provide data collection and analysis services to States to enable them to meet their airspace safety management requirements;
- b) Contribute to meeting the quantitative safety goal for Asia Pacific Region;

- c) Contribute to fostering the safe implementation of CNS/ATM initiatives within the Asia Pacific Region; and
- d) Provide a regional comprehensive airspace safety monitoring structure.

Current provision of airspace safety monitoring services

5.3 States have the responsibility to oversee airspace operations and safety. With respect to the implementation of reduced separation minima, airspace safety monitoring and safety assessments have been carried out by several different organizations:

- a) the United States Federal Aviation Administration (FAA) performs airspace safety monitoring, data collection and safety assessment in support of the ICAO Reduced Vertical Separation Minimum (RVSM) Task Force as the Asia Pacific Approvals Registry and Monitoring Organization (APARMO). The FAA has also provided airspace safety assessments and oversight for the implementation of both vertical and lateral separation minima in various parts of the region. The assessments, based on sound mathematical and analytical practices, have been accepted by States in their decisions to implement new separation minima;
- b) other States, for example Australia, have also successfully provided safety assessment services to States and ATS providers through either agreements between States, such as the Informal South Pacific ATS Co-ordinating Group (ISPACG), or at the request of the ICAO Asia Pacific Regional Office for areas such as the South China Sea and the Bay of Bengal;
- c) ICAO has also made arrangements with individual States for the ongoing overview of safety data for specific parts of the region, one example being Singapore for the South China Sea; and
- d) other States, such as Thailand, India and Japan, have indicated a willingness to provide regional or sub-regional safety monitoring and/or oversight services.

5.4 Additionally, considerable experience has been gained in the system performance monitoring and enhancement of data link equipment and procedures used to provide communications for air traffic control services. The States that are signatories to ISPACG and the Informal Pacific ATC Co-ordination Group (IPACG) have carried out the latter function co-operatively by their respective central reporting agencies (CRAs) and FANS Interoperability Teams (FITs). States and aircraft operators concerned with CRA and FIT activities have expressed satisfaction with the standards of the services provided.

Proposal for change

5.5 APANPIRG/12 considered the existing safety arrangements as described above, and the safety requirements necessary for future regional airspace planning, implementation and operation of reduced separation minima, CNS/ATM systems and related airspace changes. In view of the provisions in ICAO Annex 11 – *Air Traffic Services*, with respect to ATS safety management, APANPIRG/12 recognized that States would be required to implement systematic and appropriate safety management programmes to ensure that safety is maintained in the provision of ATS within airspaces and at aerodromes.

5.6 The States within the ASIA/PAC Region decided through APANPIRG that it would be in their best interests of safety, efficiency and administration to consider consolidating all airspace safety monitoring activities into one central agency. It is expected that adequate resources to establish and operate a regional airspace safety monitoring agency would be available in the region from

various States and commercial entities, but at present there is no centralised management of these resources.

5.7 The RASMA would identify the appropriate technical expertise available and contract out on behalf of signatory States the responsibility for performing the functions associated with airspace safety monitoring and safety assessments in international airspace. It would also be expected that the agency may be asked to provide services within the sovereign airspace of some States.

5.8 The APASM/TF developed the plan for the establishment of the RASMA based on a business plan approach. This plan sets out the details of the necessary organizational structure and functions of the RASMA to achieve APANPIRG objectives and proposes a method to obtain funding to support the organization.

6 FINANCIAL IMPLICATIONS AND COST EFFECTIVENESS

6.1 The stakeholders to be served by RASMA are a diverse group, not all of which have a financial obligation, or in some cases a financial capability, to contribute to its operation. All, however, have an interest in the output of the agency in terms of the safety assurance product in order to meet ICAO provisions or to use the airspace for international operations by their national aircraft. It is envisaged that RASMA would be in a position to assist those stakeholders as required. It is expected that benefits in the form of better utilisation of airspace through the safe and timely implementation of CNS/ATM applications would transform directly into cost savings to both the airspace users and ATM providers.

Short term objective

6.2 It is expected that operational support for the present airspace safety monitoring and safety assessment services for the region would continue to be provided under the existing financial arrangements. However, it is anticipated that it may be necessary to find sources of funding to continue some of these services.

Long term objective

6.3 The long term objective is for RASMA to be a not-for-profit and cost effective regional airspace safety and monitoring agency that is capable of assisting States in providing for all airspace safety monitoring and safety assessment needs of the Asia Pacific Region.

Funding mechanisms

6.4 It is recognised that the cost of some airspace safety monitoring services could be recovered either directly or indirectly from the users of the airspace. The region has, on a collective basis, already been successful in establishing aircraft height-keeping performance monitoring services on a “user pays” basis. Resources to meet airspace safety monitoring and assessment obligations would be provided through a user charges levy based on a unit cost per flight in the Asia Pacific region. Operating charges to airlines would be based on each aircraft movement originating from/within the APAC Region. The provision of safety monitoring services through RASMA would need to be cost effective to the industry as a whole.

7 MANAGERIAL IMPLICATIONS

7.1 A professional management team would be required to provide the necessary services to meet the objectives of RASMA.

Board of Directors

7.2 It is envisaged that a five-member Board of Directors would be appointed through APANPIRG for a fixed term from those States that have extensive experience in conducting airspace safety monitoring and safety analysis. Board membership would include qualified management, financial, technical and operational expertise. In addition, the Board would have a member appointed by aircraft operators. The ICAO Asia Pacific Regional Office would also be invited to nominate an ex-officio member. Board members would not be directly involved in the delivery of any contract, or service¹ and would not be rewarded² for their services.

Roles of the Board

7.3 The role of the Board would be to establish and undertake a work program to support agreed regional requirements for airspace safety management as requested by member States. In order to accomplish this, the Board would identify and employ resources to perform the appropriate airspace safety monitoring and safety assessment functions in the airspace concerned. The Board would also responsible to oversee the monitoring activities and report the results to the appropriate States.

Staffing for the RASMA Office

7.4 It is envisaged the RASMA Office would require the services of the following full time staff:

- a) Technical Officer – Airspace Safety Management and Liaison; and
- b) Financial/Administrative Officer.

Professional Advisers

7.5 RASMA would also be required to utilise the services of professional advisers, such as a contracting officer, legal adviser, accountant, and auditor, from time to time.

8 ALTERNATIVE SOLUTIONS

8.1 The alternative to establishing a RASMA would be to continue performing safety monitoring and safety assessment tasks as they are done currently.

9 IMPLEMENTATION STEPS

9.1 Should the meeting conceptually accept the proposal of the APASM/TF to establish a RASMA, it will then be necessary for further activities to occur in order to implement the agency. Those activities would include, but not be limited to, the following:

- a) Specify obligations of States and identify those States wishing to enter into a multinational administrative agreement for airspace safety monitoring and safety assessment services;

¹ This does not preclude a State or organization with a Board member from participating as a contractor or as a provider of a service to the RASMA.

² RASMA may pay costs for Directors traveling for Agency business purposes.

- b) Based on a), determine initial requirements for airspace safety monitoring and safety assessment services, including applicable geographical areas;
- c) Identify States and agencies available to provide airspace safety monitoring and safety assessment services;
- d) Determine need for additional States/agencies to provide airspace safety monitoring and safety assessment services;
- e) Determine funding requirements based on services and proposed costs for States and agencies providing the services;
- f) Specify procedures for selecting Board of Directors and RASMA staff;
- g) Prepare a proposal for amendment of the ASIA/PAC Regional Plan; and
- h) Formalize terms under which the services of the RASMA are to be provided in one or more multinational administrative agreements, taking into account the guidelines provided in the FASID.

9.2 It is the opinion of the APASM/TF that accomplishment of the tasks identified in the FASID and paragraph 1.2 above would require additional specialized expertise not currently available in the current Task Force.

10 RECOMMENDATIONS

10.1 The meeting is invited to

- a) review the information presented in this paper and the attached Plan for the Establishment of an Asia Pacific Regional Airspace Safety Monitoring Agency (RASMA);
- b) endorse the establishment of a regional airspace safety monitoring agency as proposed;
- c) establish a priority for completing the work of the Task Force based on the Plan;
- d) agree that there is an urgent requirement to establish the RASMA to assist States to provide the necessary airspace safety monitoring services in accordance with Annex 11;
- e) continue the work of the APASM/TF to complete the development of detailed requirements for the establishment and implementation of the RASMA as soon as practicable; and
- f) review the terms of reference and composition of the APASM/TF.

APPENDIX B

**PLAN FOR THE ESTABLISHMENT
OF AN ASIA PACIFIC
REGIONAL AIRSPACE SAFETY
MONITORING AGENCY
(RASMA)**

**Prepared
by the
APASM Task Force**

23 August 2002

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1. EXECUTIVE SUMMARY

1.1 The Twelfth Meeting of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) 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. 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 agreed that priority would be given to examining in detail the necessary arrangements to establish an appropriate regional safety structure and a funding mechanism.

1.2 To undertake this work, it was agreed that a Task Force be established reporting directly to APANPIRG with members to be provided from States and international organizations with appropriate expertise and resources to support the Task Force work.

1.3 To achieve APANPIRG objectives, the Asia Pacific Airspace Safety Monitoring (APASM) Task Force developed a plan for the establishment of a regional airspace safety monitoring agency based on a business plan approach. The organization will be known as the **Regional Airspace Safety Monitoring Agency – Asia Pacific** (RASMA – APAC) to reflect the prime functions and mandated responsibilities of the organization. The success of RASMA to meet the requirements of States in the APAC Region must be assured. 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.

1.4 The initial objective of RASMA is to provide a robust and functional management team to ensure that the services of RASMA are provided to all regional airspace and safety authorities, air traffic service providers and aircraft operators, in an efficient and cost effective manner.

1.5 The RASMA will be operated under the delegated authority of the member States in the form of a multinational administrative agreement. Those member States who may be party to the RASMA Agreement are listed in Appendix A.

1.6 It is recommended that a five member Board of Directors be appointed for a fixed period of time yet to be determined. In addition the Board would have a member appointed by aircraft operators. The ICAO Asia Pacific Regional Office would also be invited to nominate an ex-officio member.

1.7 At present, airspace safety monitoring organizations such as the Asia Pacific Approvals Registry and Monitoring Organization (APARMO) and the central reporting agencies (CRAs) of the sub-regional Future Air Navigation Systems (FANS) interoperability teams operate with financial and operational independence. In order to provide for the requisite technical services of RASMA, it is proposed that RASMA would receive funding obtained through a user charge on a “per movement” basis, and/or services in-kind through States and international organizations. The tasks required to carry out safety monitoring services within international airspace would then be contracted out.

1.8 It is foreseen that RASMA would be capable of providing airspace monitoring and safety assessment services within the sovereign airspace of APAC States if so requested.

1.9 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. In the areas of the Asia Pacific Region where RVSM and data link services have been implemented, the current estimated monitoring costs are in the order of US\$4 million per year.

1.10 It is recognised that the cost of some airspace safety monitoring services could be recovered either directly or indirectly from the users of the airspace. Resources to meet airspace safety monitoring and assessment obligations would be provided through a user charges levy based on a unit cost per flight in the Asia Pacific Region.

1.11 The stakeholders served by RASMA are a diverse group, not all of which have a financial obligation, or in some cases a financial capability, to contribute to its operation. All, however, have an interest in the output of the agency in terms of the safety assurance product in order to meet ICAO provisions or to use the airspace for international operations by their national aircraft. It is envisaged that RASMA would be in a position to assist those stakeholders as required. It is expected that benefits in the form of better utilisation of airspace through the timely implementation of CNS/ATM applications would transform directly into cost savings to both the airspace users and ATM providers.

2. INTRODUCTION

2.1 Within the Asia Pacific Region actions have been taken under various ICAO Task Forces to oversee airspace operations and safety. With respect to the implementation of reduced separation minima, the safety monitoring has been carried out by several different organizations.

2.2 The United States Federal Aviation Administration (FAA) currently performs the functions of the APARMO. Duties and responsibilities of the APARMO are shown in Appendix B. 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. The assessments, based on sound mathematical and analytical practices, have been accepted by States in their decisions to implement new separation minima. Other States, for example Australia, have also successfully provided safety assessment services to States and ATS providers through either agreements between States, such as the Informal South Pacific ATS Co-ordinating Group (ISPACG), or at the request of the ICAO Asia Pacific Regional Office for areas such as the South China Sea and the Bay of Bengal. ICAO has also made arrangements with individual States for the ongoing overview of safety data for specific parts of the region, one example being Singapore for the South China Sea. Other States, such as Thailand, India and Japan, have indicated a willingness to provide regional or sub-regional safety monitoring and/or oversight services.

2.3 Additionally, considerable experience has been gained in the system performance monitoring and enhancement of data link equipment and procedures used to provide communications for air traffic control services. The States that are signatories to ISPACG and the Informal Pacific ATC Co-ordination Group (IPACG) have carried out the latter function co-operatively by their respective CRAs and FANS Interoperability Teams (FITs). Duties and responsibilities of the CRA are shown in Appendix C. States and aircraft operators concerned with CRA and FIT activities have expressed satisfaction with the standards of the services provided. In addition, the FANS Action Team – Bay of Bengal (FATBOB), has been established by ICAO for the Bay of Bengal area.

2.4 APANPIRG/12 considered the existing safety arrangements as described above, and the safety requirements necessary for future regional airspace planning, implementation and operation of reduced separation minima, CNS/ATM systems and related airspace changes. In view of the provisions in ICAO Annex 11 — *Air Traffic Services*, with respect to ATS safety management, APANPIRG/12 recognized that States would be required to implement systematic and appropriate safety management programmes to ensure that safety is maintained in the provision of ATS within airspaces and at aerodromes.

2.5 The States within the Asia Pacific Region decided through APANPIRG that it would be in their best interests of safety, efficiency and administration to consolidate all airspace safety monitoring activities into one central agency. This agency would take overall responsibility for performing the functions associated with airspace safety monitoring and safety assessments. In many cases, because of the large oceanic areas of the region, the agency may also be asked to provide services within the sovereign airspace of some States.

2.6 Based on Decision 12/44 of APANPIRG/12, the Asia Pacific Airspace Safety Monitoring (APASM) Task Force was established to investigate the formation of a regional organization to manage airspace safety monitoring activities.

2.7 It is expected that adequate resources to establish and operate a regional airspace safety monitoring agency would be available in the region from various States and commercial entities, but at present there is no centralised management of these resources.

2.8 The APASM Task Force decided to develop a plan for the establishment of the RASMA based on a business plan approach. This plan sets out the details of the necessary organizational structure and functions of the RASMA to achieve APANPIRG objectives and proposes a method to obtain funding to support the organization. In developing the RASMA plan, the information provided in the Asia Pacific Facilities and Services Implementation Document (FASID) has been taken into account.

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.

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 RASMA could assist States in achieving this objective. Because the safety assessment methodology will be applied to 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. ORGANIZATIONAL NAME

4.1 The organization will be known as the Regional Airspace Safety Monitoring Agency – Asia Pacific (RASMA – APAC) to reflect the prime functions and mandated responsibilities of the enterprise.

5. ESTABLISHMENT OF AUTHORITY

5.1 The RASMA requires formal recognition and credentials as provided by the States through a multilateral administrative agreement. The RASMA would need to obtain and exchange information from States, ATS providers, regulatory authorities, aircraft operators, and monitoring agencies in other ICAO regions. Furthermore, all stakeholders must accept the processing of monitoring data and the safety assessments provided by the RASMA. Without APANPIRG designation or regional agreements, these interactions would not be possible. Those member States who may be party to the RASMA Agreement are listed in Appendix A.

6. GEOGRAPHICAL AREA

6.1 The boundaries of RASMA activity will be the ICAO APAC Region. This represents approximately 35% of the world's commercially used airspace and contains the world's three most populated countries. The region also contains the world's largest oceanic area and the most dispersed island archipelagos.

6.2 The nine major geographic traffic flows identified for the APAC Region establish the necessity for close liaison and co-ordination between APAC member States, as well as co-ordination with States outside the Region where flights terminate or transit through their airspace.

7. RASMA OBJECTIVES

7.1 The initial objective is to provide a robust and functional management team to ensure that the services of the RASMA are provided to all regional airspace and safety authorities, air traffic service providers and aircraft operators, in an efficient and cost effective manner.

7.2 The objectives proposed for the RASMA - APAC are to:

- a) Provide data collection and analysis services to States to enable them to meet their airspace safety management requirements;
- b) Contribute to meeting the quantitative safety goal for Asia Pacific Region;
- c) Contribute to fostering the safe implementation of CNS/ATM initiatives within the Asia Pacific Region; and
- d) Provide a regional comprehensive airspace safety monitoring structure.

8. MANAGEMENT ORGANIZATION

8.1 A professional management team will be required to provide the necessary services to meet the objectives of RASMA. The organization of RASMA and its relationship to contracted service providers are shown in Appendix D and described below.

Board of Directors

8.2 It is envisaged that a five-member Board of Directors would be appointed through APANPIRG for a fixed term from those States that have extensive experience in conducting airspace safety monitoring and safety analysis. Board membership would include qualified management, financial, technical and operational expertise. In addition, the Board would have a member appointed by aircraft operators. The ICAO Asia Pacific Regional Office would also be invited to nominate an ex-officio member. Board members would not be directly involved in the delivery of any contract, or service¹ and would not be rewarded² for their services.

Roles of the Board

8.3 The role of the Board is to establish and undertake a work program to support agreed regional requirements for airspace safety management as requested by member States. In order to accomplish this, the Board will identify and employ resources to perform the appropriate airspace safety monitoring and safety assessment functions in the airspace concerned. The Board is also responsible to oversee the monitoring activities and report the results to the appropriate States.

Staffing for the RASMA Office

8.4 It is envisaged the RASMA Office will require the services of the following full time staff:

- a) Technical Officer – Airspace Safety Management and Liaison
- b) Financial/Administrative Officer

Skills and Experience/Qualifications

8.5 It will be necessary for RASMA to continue to use the resources of the agencies now providing safety monitoring services on the same donated or contractual basis. The qualifications and experience needed for the airspace safety risk monitoring and safety assessments are highly specialised and limited in availability. In order to provide services for future CNS/ATM applications, it may be necessary to contract additional personnel and organizations with the necessary technical and administrative skills and experience.

Job Descriptions

8.6 The RASMA Office staff draft job descriptions are listed at Appendix E-1 and E-2.

Professional Advisers

8.7 RASMA will be required to utilise the services of professional advisers, such as a contracting officer, legal adviser, accountant, and auditor, from time to time.

¹ This does not preclude a State or organization with a Board member from participating as a contractor or as a provider of a service to the RASMA.

² RASMA may pay costs for Directors traveling for Agency business purposes.

Contract Establishment

- 8.8 The Board will determine contractual requirements for:
- a) The activities to be monitored;
 - b) The geographical area(s) within the APAC Region to be monitored, and
 - c) The general tasks that form an integral part of the respective contracts.

Evaluation and Selection of Contractors

- 8.9 The Board will maintain overall responsibility for:
- a) Contract supervision
 - b) Approval of payments
 - c) Financial management
 - d) Budget
 - e) Revenue
 - f) Expenses

Reporting

- 8.10 The Board will report³ on behalf of RASMA to member States through APANPIRG.

Governance

- 8.11 Financial and general governance will follow appropriate international standards and practices.

Management Costs

- 8.12 Funding for the establishment and ongoing costs of the RASMA Board of Directors and the management staff will need to be addressed in the multinational administrative agreement.

9. RESPONSIBILITIES AND TASKS

- 9.1 RASMA will be responsible to arrange for:
- a) airspace safety and system performance monitoring, as required, in the areas of communications, navigation, surveillance and air traffic management; and
 - b) data analysis

³ The Board is responsible to the Contracting States under the terms of the multinational administrative agreement.

with the objective of providing information to indicate whether individual system components and overall system performance meets required safety targets, which may be determined from time to time by ICAO and adopted for regional application by APANPIRG.

9.2 These responsibilities will be met by:

- a) Establishing and maintaining databases containing the results of CNS system performance monitoring, including, but not limited to, significant lateral and vertical navigation deviations, data link communications performance and the results of requests to operators and States for information explaining the causes of observed deviations or substandard performance;
- b) Maintaining central registries of State approvals of operators and aircraft using concerned airspace for RVSM, RNP and other elements of CNS/ATM as required;
- c) Ensuring a means is available for identifying non-approved operators within concerned airspace where a State approval for operations involving RVSM, RNP or another elements of CNS/ATM is required; and notifying the appropriate State approval authority of such operators;
- d) Providing timely information on changes of RVSM monitoring status of aircraft type classifications to State authorities and operators;
- e) Collecting traffic movement data in support of safety assessments as required;
- f) Conducting assessments of risk as required;
- g) Advising stakeholders and APANPIRG of the results of periodic risk assessments specifically highlighting any adverse trends for their appropriate review and action;
- h) Coordinating with organizations in other regions and facilitating the transfer of aircraft approval data in order to ensure inter-regional harmonisation; and
- i) Maintaining a problem report process, which can be easily accessed by all concerned Stakeholders.

10. DESCRIPTION OF THE RASMA PROCESS

10.1 It is anticipated that the majority of the services required, such as data collection, data analysis and safety assessments will need to be contracted out to ATS providers or commercial entities. This is a very specialised technical field that will attract bidders for the provision of services. It will be important to the region that RASMA be able to effectively manage the technical resources and services offered to the region by both commercial and state enterprises.

10.2 The functional description of the RASMA process showing the structure and linkages is attached as Appendix F.

11. FINANCING

11.1 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.

Short Term Objectives

11.2 It is expected that operational support for the present airspace safety monitoring and safety assessment services for the region would continue to be provided under the existing financial arrangements. However, it is anticipated that it may be necessary to find sources of funding to continue some of these services.

Long Term Objective

11.3 The long term objective is for RASMA to be a not-for-profit and cost effective regional airspace safety and monitoring agency that is capable of assisting States in providing for all airspace safety monitoring and safety assessment needs of the Asia Pacific Region.

Financial Arrangements

11.4 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 through RASMA will need to be cost effective to the industry as a whole.

Funding Resources

11.5 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 RASMA to meet 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.

11.6 Where funds are provided by direct payment, the preferred collection mechanism would be through a direct levy on the airlines to be collected by a collection agency through established mechanisms. It would be necessary to establish a contractual relationship between RASMA and the collection agency in this regard.

11.7 In the areas of the Asia Pacific Region where RVSM and data link services have been implemented, the current estimated monitoring costs are in the order of US\$4 million per year.

12. LEGAL ISSUES

12.1 A formalised legal structure is essential in order to comply with the obligations of State civil aviation authorities in accordance with the Annexes to the Convention on International Civil Aviation. This structure could be enacted by multilateral administrative agreement between States and RASMA.

12.2 A legal framework is necessary to address issues associated with recruitment, employment terms and conditions, staff gratuities, contract terms and conditions, tax liability, insurance and risk management, salaries, transport, etc.

12.3 Individual States may need to enact appropriate air navigation legislation to accept the safety assessments provided under contract to RASMA as valid for use within the airspace under their control.

13. STAKEHOLDERS

13.1 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 regional airspace safety monitoring agency centralises the tasks under one management organization and therefore will maximise functionality, data reliability, economical resource management and the provision of airspace safety management information to internationally recognised standards. The benefits to be realised by all stakeholders with the judicious application of this information into improved airspace safety management are expected to be significant.

13.2 The stakeholders served by this agency are a diverse group, not all of which have a financial obligation, or in some cases a financial capability, to contribute to the agency. All, however, have an interest in the output of the agency in terms of the safety assurance product due to its mandate by ICAO provisions or the use of the airspace for international operations by their national aircraft. 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 RASMA.

13.3 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. This development is not confined to individual stakeholders but is reliant on continuous close and financially equitable co-operation between all the stakeholders.

13.4 The RASMA must be a stakeholder-driven enterprise that is fully responsive to not only the safety requirements of the region but also to the commercial realities of the need for cost effective safety services. Without the benefit of cost effectiveness it will be difficult for RASMA to fulfil its primary role of providing standardised airspace safety assessments to the region.

14. BUSINESS APPROACH

Accounting Standards

14.1 International accounting standards (IAS) will be used. A balance sheet accounting system will be adopted for RASMA. A recognised quality control system will be adopted.

14.2 All accounts will be audited and presented to stakeholders. It is envisaged that auditing services will be provided “in kind”.

Performance Indicators

14.3 The Board of Directors will undertake a review of financial and operational data, initially at quarterly intervals for the first year, and thereafter at minimum annual periods or as required. The RASMA office will submit these status reports to the Board clearly showing the indicators for both financial efficiency and operational data compilation.

Current Assets and Liabilities

14.4 At the time of start-up, current assets will be of very low value and current liabilities will amount to the cost of setting up and running the RASMA office.

RASMA Office

14.5 The accommodation requirements for the administration of the RASMA should be modest and low cost. The location of the administration of the agency in the ICAO Regional Office building or other donated space could minimise the overall cost of running the organization. However, it is recognised that the same function could be provided directly by a signatory State, either on a cost recovery basis or gratis, and the RASMA office located in that State.

APPENDIX A

LIST OF PARTICIPATING STATES in RASMA

Australia	Micronesia, Federated States of
Bangladesh	Mongolia
Bhutan	Myanmar
Brunei Darussalam	Nauru
Cambodia	Nepal
China	New Caledonia
Cook Islands	New Zealand
Democratic People's Republic of Korea	Palau
Fiji	Papua New Guinea
French Polynesia	Philippines
Hong Kong, China	Republic of Korea
India	Samoa
Indonesia	Singapore
Japan	Solomon Islands
Kiribati	Sri Lanka
Lao People's Democratic Republic	Thailand
Macao, China	Tonga
Malaysia	USA (Pacific Regional airspace)
Maldives	Vanuatu
Marshall Islands	Vietnam

Note. — It will be necessary to coordinate with States in adjacent regions to accommodate financial issues related to the major traffic flows.

APPENDIX C

DATA LINK CENTRAL REPORTING AGENCY

Routine collection of data is necessary in order to ensure that the system continues to meet its performance, safety and interoperability requirements, and that the operations and procedures are working as planned.

The Data Link Central Reporting Agencies (CRAs) cover three fields of the activities that are processing of problem reports, data link performance monitoring and support to development of data link procedures and CNS/ATM improvements including coordination for testing.

a) Problem report processing

The problem reports are submitted from the FIT (FANS Interoperability Team) members, mostly from operators and ATSUs. The tasks of CRA are:

- collection, collation and analysis of problem reports
- monitoring the status of remedial actions
- de-identification of data
- register of de-identified data on website

The website is accessible to the FIT members who signed the confidential agreement.

b) Data link system performance monitoring

The CRAs are tasked with the regular dissemination of de-identified statistical data, as an indication of system performance, that are processed with the periodic status reports on the data link system performance received from ATSUs. RASMA will assess the data link system performance based on the information disseminated by CRAs.

c) Special studies or support to testing regarding data link and CNS/ATM procedure improvements

d) Reporting

The CRAs will report to RASMA.

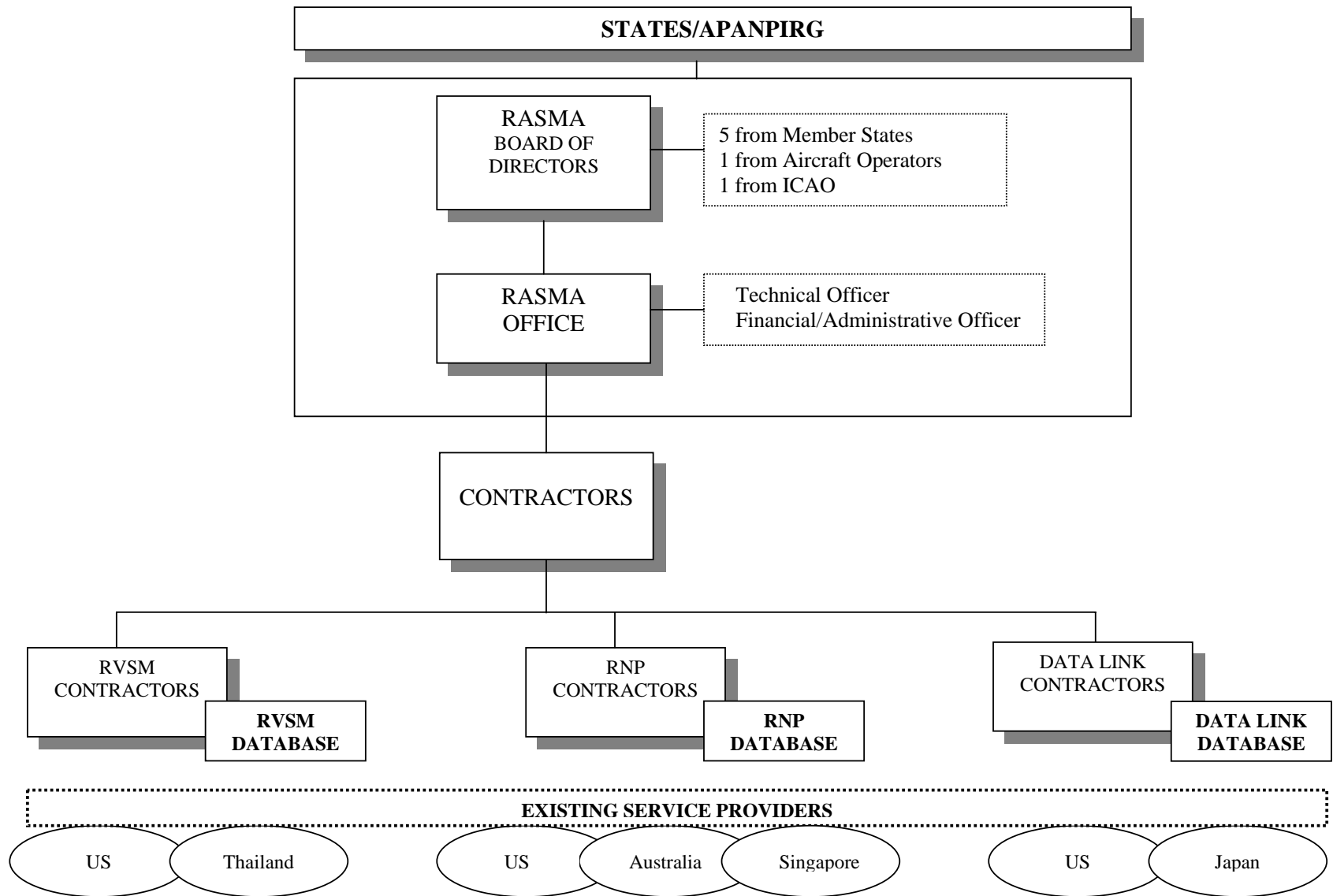
APPENDIX B

DUTIES AND RESPONSIBILITIES OF APARMO

The Asia/Pacific Approvals Registry and Monitoring Organization (APARMO) has the following duties and responsibilities:

- a) to establish and maintain a central registry of State RVSM approvals of operators and aircraft using the Asia Pacific Region airspace where RVSM will be applied;
- b) to facilitate the transfer of approval data to and from other RVSM regional monitoring agencies;
- c) to establish and maintain a data base containing the results of height keeping performance monitoring and all altitude deviations of 300 ft or more within Asia/Pacific Region airspace, and to include in the data base the results of APARMO requests to operators and States for information explaining the causes of observed large height deviations;
- d) provide timely information on changes of monitoring status of aircraft type classifications to State authorities and operators;
- e) to assume overall responsibility for:
 - i) administration of the Global Positioning System Monitoring System (GMS); and
 - ii) assessing compliance of operators and aircraft with RVSM height-keeping performance requirementsin conjunction with RVSM introduction in the Asia/Pacific Region;
- f) to provide the means for identifying non-RVSM approved operators using Asia/Pacific airspace where RVSM is applied, and notifying the appropriate State approval authority; and
- g) to develop the means for summarizing and communicating the content of relevant data bases to ICAO RVSM Task Force decision makers for use in agreeing on the timing and extent of RVSM application within the airspace under their administration.

Appendix D - RASMA Organizational Chart



APPENDIX E-1

DRAFT JOB DESCRIPTION

Title:	Technical Officer – Airspace Safety Management and Liaison
Duty Station:	RASMA Agency location (To be determined)
Starting Date:	On signing of the agreement.
Duration:	Initial 3 year term with renewal option

QUALIFICATIONS AND EXPERIENCE REQUIREMENTS

1. University degree or an equivalent technical qualification.
2. Be highly motivated and regionally accepted as an authority in specific areas of expertise - such as Aeronautical telecommunications engineering, Flight Operations or ATS, including the new CNS/ATM system and be able to contribute in the enhancement of RASMA's knowledge and capability. Specialist knowledge of database establishment, maintenance and analysis desired.
3. A minimum of 10 years practical experience in the provisioning of air navigation, air traffic management services and regulatory affairs. Wide knowledge of internationally standardised concepts, practices and procedures to handle especially complex aeronautical tasks and to provide leadership to others - within both the airline and Civil Aviation communities at large. An intimate knowledge of ADS and CPDLC service provision desirable.
4. Experience in the establishment and management of a regional representative office including development of budgetary provisions and reporting.
5. Command of the English language in written and spoken forms. Proven ability to prepare technical and informative documentation to a high standard in this language.
6. Initiative, tact, sound judgement and the ability to maintain harmonious working relationships.

DUTIES

1. Develop a statement of airspace safety monitoring responsibilities for conducting a comprehensive undertaking for RASMA activity within the APAC Region.
2. Establish a RASMA office in the APAC region capable of meeting the listed responsibilities and tasks of RASMA.
3. Management of the RASMA Office including coordination and planning of technical activities and budgetary control.
4. Assisting in the development of short, medium term and long-term objectives of RASMA airspace safety monitoring activity and the strategies required to achieve them.
5. Make arrangements for the implementation of airspace safety and system performance monitoring as required for CNS/ATM related activity.
6. Establish and maintain databases containing the CNS systems performance monitoring results including but not limited to large lateral and vertical navigation deviations, data link communications performance and disseminate the results to States and operators.
7. Establish and maintain databases containing the CNS systems performance monitoring results including but not limited to large lateral and vertical navigation deviations, data link communications performance and disseminate the results to States and operators.
8. Maintain a central registry of State approvals of operators and aircraft using concerned airspace for RVSM, RNP and other associated CNS/ATM elements.

RASMA Plan
Appendix E-1

9. Assume overall managerial responsibility for the RASMA data collection process, and is directly accountable for the quality and conformity of the contracted products and services in accordance with RASMA technical policies.
10. Report results of activity to Stakeholders.
11. Perform other related duties as required.

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APPENDIX E-2

DRAFT JOB DESCRIPTION

Title:	Financial/Administrative Officer
Duty Station:	RASMA Agency location (To be determined)
Starting Date:	On signing of the agreement.
Duration:	Initial 3 year term with renewal option

QUALIFICATIONS AND EXPERIENCE REQUIREMENTS

1. Professional or advanced qualifications in accountancy and office administrative management.
2. A minimum of 10 years practical experience in a senior finance and administration position with an organization involved with regional affairs.
3. Experience in the preparation of ledger and other appropriate financial requirements for the preparation of operating budgets and presentation of financial status to the RASMA Board of Directors.
4. Experience in the management of a representative office including the establishment and maintenance of account records in accordance with international accounting standards presentable for external audit.
5. Command of the English language in written and spoken forms. Proven ability to prepare technical and informative documentation to a high standard in this language.
6. Initiative, tact, sound judgement and the ability to maintain harmonious working relationships.

DUTIES

Finance

1. Establish and maintain a database of all regional movements to be charged for RASMA operational expenses and co-ordinate operational flight movement data.
2. Establish and maintain appropriate ledgers in accordance with international accounting standards.
3. Process all incoming debtors' receipts, either cash, cheque or credit card. Verify against outstanding balances and post receipts to the appropriate ledgers.
4. Produce monthly Ageing Analysis of Debtors and co-ordinate with relevant States of registry for follow-up action.
5. Ensure that all revenues and expenditures are accounted for in accordance with requirements and standards.
6. Perform month end periodic closing procedure.
7. Perform all bank and suspense account reconciliation.
8. Prepare and process quarterly ledger reports for lodgement with Inland Revenue as required.
9. Ensure that States and APANPIRG receive monthly RASMA financial status reports in a timely manner and attend to any queries.
10. Approve payments and counter sign cheques.

11. Co-ordinate the approval of invoices from contractors and match invoices with Purchase Orders as necessary.
12. Prepare cheques for counter signature in settlement of all local and contracted supplier accounts and ensures that creditor payment terms are complied with.
13. Maintain and effect reimbursement of office Petty Cash facility.
14. Check and reconcile Courier Invoices against internally generated reports
15. Perform all General Ledger posting resulting from Accounts Payable transactions.
16. Generate reports for user departments.

ADMINISTRATION

1. Co-ordinate all RASMA related administration activities which includes liaison with contractors, suppliers, landlord, banks, credit card companies, etc.
2. Maintain and administer all office security systems to protect intellectual property supplied by contractors.
3. Oversee the overall office maintenance and supervise the upkeep of office equipment.
4. Maintain and update the various contract agreements with suppliers and contractors.

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APPENDIX F – DESCRIPTION OF RASMA PROCESS

