

INTERNATIONAL CIVIL AVIATION ORGANIZATION



REPORT OF THE FOURTH MEETING OF THE REGIONAL AIRSPACE SAFETY MONITORING ADVISORY GROUP (RASMAG/4)

BANGKOK, THAILAND, 25 – 28 OCTOBER 2005

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

Adopted by the RASMAG
and published by the ICAO Asia and Pacific Office

RASMAG/4
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HISTORY OF THE MEETING

1. Introduction

1.1 The Fourth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/4) was held in Bangkok from 25 to 28 October 2005 at the Kotaite Wing of the ICAO Asia/Pacific Office.

2. Attendance

2.1 The meeting was attended by 30 participants from Australia, Hong Kong China, India, Japan, New Zealand, Singapore, Thailand, United States, IATA and IFALPA, including Mongolia as observer. A list of participants is at **Appendix A** to this report.

3. Officers & Regional Office

3.1. Ms. Leslie McCormick, Operations Planning International, Americas Group for the FAA acted as Chairperson and presided over the meeting throughout its duration.

3.2. Mr. Andrew Tiede, Regional Officer ATM, was the Secretary for the meeting.

4. Opening of the Meeting

4.1 The meeting was opened by Mr. Andrew Tiede on behalf of Mr. Lalit Shah, Regional Director of the Asia/Pacific Regional Office, who welcomed the participants to Bangkok and the fourth meeting of the RASMAG. Mr. Tiede commented on the success of the first three RASMAG meetings and the ICAO ATS Safety Seminar, which was held immediately following the last meeting, and wished this meeting every success.

4.2 Mr. Tiede advised the meeting that a draft version of the ICAO Safety Management Manual, Doc 9859, had been completed, and that a copy would be made available to those interested. He informed the meeting that the Sixteenth Meeting of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/16) and the 42nd Conference of Directors General of Civil Aviation, Asia and Pacific Regions, had both engaged in significant discussions on safety management, including the funding of safety monitoring programs, both of interest to the activities of RASMAG. Detailed information on the outcomes of those discussions would be provided to this meeting.

4.3 Ms. Leslie McCormick, United States Federal Aviation Administration (FAA), welcomed the members of RASMAG to the meeting and advised the representatives that the RASMAG Chairman, Mr. Robert Butcher (Airservices Australia) was unable to attend due to other urgent commitments. He sent his regrets, and had asked her to serve as Chairperson for this meeting. Ms. McCormick recognized the Secretary for his excellent preparation of information on the outcomes of the many recent meetings that had addressed safety management issues.

5. Documentation and Working Language

5.1 The working language of the meeting as well as all documentation was in English.

5.2 Twelve (12) Working Papers and Six (6) Information Papers were presented to the meeting. A list of papers is included at **Appendix B** to this Report.

REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of Agenda

1.1 The meeting considered the provisional agenda that had been proposed by the Regional Office and, noting that the 3 regional RMAs would take the opportunity presented by the RASMAG/4 meeting to hold a side meeting in respect of RMA matters in accordance with the RASMAG task list item 3/6, added an additional agenda item in this respect. Additionally, the meeting recognized the importance of the ongoing work in relation to the funding of regional safety monitoring activities and included this in the agenda for the meeting. Accordingly, the meeting adopted the following agenda:

- Agenda Item 1: Adoption of Agenda
- Agenda Item 2: Review of APANPIRG/16 and 42nd DGCA Conference outcomes
- Agenda Item 3: Airspace safety monitoring documentation and regional guidance material
- Agenda Item 4: Review the airspace safety monitoring arrangements in the Asia/Pacific Region and the activities of regional airspace safety monitoring agencies
- Agenda Item 5: Review of regional safety assessment activities/requirements
- Agenda Item 6: Review and update RASMAG Task List
- Agenda Item 7: Funding of Regional Safety Monitoring Activities
- Agenda Item 8: Tripartite RMA Meeting
- Agenda Item 9: Any other business
- Agenda Item 10: Date and venue of the RASMAG/5 Meeting

Agenda Item 2: Review of APANPIRG/16 and 42nd DGCA Conference outcomes

Outcomes of APANPIRG/16 in relation to RASMAG

2.1 The 16th meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/16) was held at Bangkok, Thailand, from 22-26 August 2005. The meeting reviewed extracts from the Report of APANPIRG/16, noting that APANPIRG/16 had endorsed a total of 62 Conclusions and Decisions, of which the following 11 Conclusions and one Decision were of relevance to the work of RASMAG:

APANPIRG/16 List of Conclusions and Decisions

- | | |
|------------------|--|
| Decision 16/1 | – Safety Monitoring Agency (SMA) |
| Conclusion 16/2 | – Funding arrangements for regional airspace safety monitoring |
| Conclusion 16/3 | – Large Height Deviations – Western Pacific/South China Sea area |
| Conclusion 16/4 | – Traffic Sample Data Collection |
| Conclusion 16/5 | – Non-implementation of reduced separation unless compliant with Annex 11 |
| Conclusion 16/6 | – Non-provision of safety related data by States |
| Conclusion 16/12 | – Implementation of 30/30 NM Separation Minima |
| Conclusion 16/18 | – Assistance to States to develop safety management systems |
| Conclusion 16/19 | – Study of States' preparedness to implement safety management systems |
| Conclusion 16/20 | – Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region |
| Conclusion 16/57 | – Workshop on Fuel Savings Measures |
| Conclusion 16/62 | – State focal point for safety-related activities |

Large Height Deviations Western Pacific/South China Sea (WPAC/SCS)

2.2 APANPIRG/16 was advised that the Monitoring Agency for the Asia Region (MAAR) had reported to RASMAG/3 (June 2005) that the overall risk for the WPAC/SCS area was provisionally assessed as 4.9×10^{-9} fatal accidents per flight hour, compared to the required TLS of 5×10^{-9} fatal accidents per flight hour. MAAR was extremely concerned that the TLS may have been exceeded given the calculated high risk value and the fact that there was a significant amount of data unavailable from some States.

2.3 In considering the information also provided by MAAR that 123 Large Height Deviations (LHD) reports had been received for the period January 2003 to August 2005, APANPIRG/16 agreed with the strong concern that had been expressed by MAAR, RASMAG/3 and the ATM/AIS/SAR/SG/15 (July 2005) in respect of the numbers of LHDs that were occurring and formulated the following Conclusion:

Conclusion 16/3 – Large Height Deviations – Western Pacific/South China Sea area

That, in noting the prevalence of RVSM large height deviation occurrences in the Western Pacific/South China Sea area, the Regional Office draw the attention of all States concerned to identify and put in place remedial actions to mitigate such significant errors on an urgent basis.

2.4 In discussing this matter, RASMAG/4 requested that the Regional Office also write to States to again alert them to the need to undertake traffic sampling in December 2005. In respect of LHD reporting, IATA expressed concern about the role of operators in providing LHD reports to the air traffic service provider of the airspace concerned (in addition to the normal pilot report via radio) as well as to the State of Registry as required, as it would lead to duplication of reporting. IATA noted that the requirement in other FIRs where RVSM had been implemented was for the operator to report only to its State of Registry in addition to the normal ATS report.

2.5 Australia noted that there were 2 sources of LHD;

- a) From operators due to WX deviation or TCAS deviation etc,
- b) From ATC errors (eg. flight level handover or failure to pass an estimate to adjacent unit)

2.6 In the case of WX deviation, the meeting considered that these should be reported by operators as ATC may not be aware of the deviation. The meeting agreed that the matter should be reviewed by the RVSM/TF its next meeting and the Regional Office undertook to include it on the agenda of the RVSM/TF.

Safety assessment for RNP10 Operations in the SCS area

2.7 The meeting reviewed the status of the safety assessment for RNP10 operations in the SCS area, noting that APANPIRG/16 had been advised that a safety assessment had not been undertaken since implementation of the revised route structure in November 2001, approximately 4 years ago.

2.8 APANPIRG/16 was advised that RASMAG/3 and the ATM/AIS/SAR/SG/15 had noted the very limited number of parties that could undertake this complex assessment work and that a number of States had been asked to confirm to RASMAG/4 their ability to assist in ensuring that the safety assessment was completed in a timely manner.

2.9 Australia reported to RASMAG/4 that Airservices Australia was in a position to complete the required safety assessment as a one off event, on the basis of a formal request for assistance from the Regional Office. In noting that Airservices Australia had completed the pre-implementation safety assessment for the route structure during 2001, the meeting thanked Australia for this extremely generous offer that would address the very urgent need for a current safety assessment for the SCS route structure.

2.10 RASMAG/4 agreed that collection of a suitable traffic sample data during the standardized 30 day December sampling period established by RASMAG was necessary in order to enable the safety assessment to be completed. In general terms, the data required was a traffic movement count and records of any lateral or longitudinal deviation for any reason. The Regional Office would undertake coordination with Airservices Australia to finalize arrangements for the conduct of the safety assessment, including the preparation of an appropriate template for data collection that would define the airspace and routes that were to be considered and identify all the parameters that were required to be collected during the sampling period. MAAR agreed that they would also assist in these activities where possible, in order to broaden their knowledge and experience in relation to SMA matters.

2.11 The Regional Office would promulgate arrangements for the data collection via State Letter as soon as possible, to enable affected States to make suitable arrangements. It was anticipated that the outcomes of the safety assessment would be available before the end of April 2006, in order to enable reporting to the 13th meeting of the South-East Asia ATS Coordination Group in May 2006 and to RASMAG/5 in June 2006.

2.12 The meeting recalled that when the revised South China Sea route structure was implemented on 1 November 2001, an essential aspect of the project was the establishment of RNP 10 monitoring arrangements along four of the routes, *i.e.* L625, M771, N884 and N892. Hong Kong China, Philippines and Singapore were made responsible for the collection of relevant data concerning flight operations along these routes, including examples of Gross Navigational Errors (GNE, >15NM lateral displacement) and a letter of agreement was established in this respect. These States were also required to forward the data collected, each month, to the Civil Aviation Authority of Singapore (CAAS), which is the monitoring authority for RNP 10 operations over the South China Sea. Singapore undertook to finalize the collation of December 2005 data in this respect and provide this information to the Regional Office as soon as possible for inclusion in the safety assessment.

Delay to the Review of FLOS in the WPAC/SCS Area

2.13 APANPIRG/16 was informed that during the review by RVSM/TF/22 (September 2004) of the regional flight level orientation schemes (FLOS) issues, States agreed to a work programme aimed at reviewing and amending the modified single alternate FLOS presently in use in the WPAC/SCS areas. This had become necessary due to difficulties being experienced with transition procedures at the interface with the modified single alternate FLOS arrangements in use in the WPAC/SCS area after implementation of RVSM in the Bay of Bengal and Beyond area in November 2003 using a single alternate FLOS.

2.14 RASMAG/3 recognized that the non provision of safety data by some States and consequent delay to completing the safety assessment would lead to a deferment of at least 12 months in the implementation of any proposed changes to the WPAC/SCS FLOS. In recalling the large number of LHDs occurring in the WPAC/SCS, APANPIRG/16 expressed very strong concerns that arrangements agreed at RVSM/TF/22 were expected to assist in reducing the numbers of LHDs and therefore should be progressed with the minimum of delay.

2.15 RASMAG/4 was informed in respect of the outcomes of the Special ATS Coordination meeting for RVSM Task Force – Review of Western Pacific/South China Sea FLOS (SCM RVSM FLOS) that had been held at AEROTHAI Headquarters, Bangkok, on 20 September 2005 in order to progress arrangements for the RVSM/TF/28 FLOS Review Meeting which would be held from 24 – 28 April 2006.

2.16 The SCM RVSM FLOS was advised that Mr Sydney Maniam, the Chairman of the RVSM/TF, would retire from service with the Civil Aviation Authority of Singapore (CAAS) in early 2006 and would therefore no longer be able to serve as Chairman of the RVSM/TF. Mr Kuah Kong Beng (CAAS) would act as Chairman until the matter could be considered by the RVSM/TF at its next meeting. The SCM RVSM FLOS considered the following issues:

- a) Updates of traffic sample data (TSD) for July 2004 and monthly large height deviation (LHD) provided by WPAC/SCS States;
- b) TSD collection in December 2005 for WPAC/SCS and November 2005 for Japan and the Republic of Korea (ROK) 90 day review;
- c) Safety oversight for WPAC/SCS RVSM implementation using current FLOS (modified single alternate) with available data;
- d) Revise TSD and LHD template and instructions, and the notification process to States (WPAC/SCS, Bay of Bengal and Japan/ROK);

- e) Summary of FLOS scenarios to be assessed; and
- f) Meeting dates for the 90 day review of the Japan/Republic of Korea implementation and the FLOS review meeting.

2.17 MAAR provided SCM RVSM FLOS with three scenarios as a basis for conducting the international safety assessments for the FLOS review as follows:

- a) Base Case: Current FLOS in WPAC/SCS;
- b) Scenario 1: Proposed FLOS change at the RVSM/TF/22 (September 2004); and
- c) Scenario 2: Scenario 1 with minor FLOS change on A1/P901.

2.18 Scenario 2 was essentially the same as Scenario 1, but with minor changes on A1/P901 to mitigate passing frequency. In order to eliminate existing transition issues while reducing the passing frequency on A1/P901, the following FLOS on A1/P901 was proposed by MAAR for further consideration by the FLOS review meeting:

- a) Class I: NB/SB: FL 310, 320, 350, 360, 390, 400
- b) Class II: EB: FL 290, 330, 370, 410
WB: FL 300, 340, 380
- c) Class III: EB: FL 310, 350, 390
WB: FL 320, 360, 400
- d) Class IV: EB: FL 290, 310, 330, 370, 410
WB: FL 300, 340, 380, 400

2.19 MAAR advised SCM RVSM FLOS that in Scenario 2, two flight levels were taken out for each direction of flight to reduce the passing frequency. The decision on which flight levels could be removed should be coordinated with affected States, including China, Hong Kong, China, Lao PDR, Viet Nam. The meeting agreed that the Regional Office would undertake coordination with affected States in this respect.

2.20 The SCM RVSM FLOS noted that not all the States concerned had been present at the RVSM/TF/22 which had developed the Scenario 1. Also, in order to facilitate the discussion at the RVSM/TF/28, SCM RVSM FLOS suggested that it would be useful to include the scenarios in the invitation letter for States to be able to consider in advance. The Regional Office agreed to advise States by letter of the different scenarios and request that States complete required safety analysis and simulation of the scenarios as soon as possible, in preparation for RVSM/TF/28.

2.21 The SCM RVSM FLOS considered the schedule for the RVSM/TF/27 and 28 meetings, agreeing that RVSM/TF/27 (90 day review Japan/Republic of Korea) be held from 27 February to 1 March 2006 and the RVSM/TF/28 (Review of WPAC/SCS FLOS) from 24 to 28 April 2006.

Non Submission by States of Safety Related Data

2.22 APANPIRG/16 was appraised of concerns raised by RASMAG that some States had failed to fulfill their obligations towards ICAO safety requirements for ongoing operation of RVSM, noting a number of disturbing issues that had been identified by MAAR and PARMO that required urgent follow up:

- a) missing traffic sample data;
- b) missing large height deviation reports;
- c) incomplete and non-reporting of State RVSM approvals registry data; and
- d) incomplete information on follow-up monitoring of aircraft height-keeping performance in accordance with the minimum monitoring requirements.

2.23 In accordance with the concerns raised by RASMAG/2 (October 2004) in respect of the non provision of data by States, the Regional Office had presented a discussion paper during the 41st Conference of the Director Generals of Civil Aviation of the Asia/Pacific Region held in Hong Kong, China during November 2004, seeking action to rectify the non provision of safety related data by some States.

2.24 RASMAG/3 had also expressed significant concern in respect of the non-provision of data and drafted a formal statement for consideration by APANPIRG/16. After reviewing the information from RASMAG, APANPIRG/16 adopted the following Conclusions:

Conclusion 16/5 – No implementation of reduced separation unless compliant with Annex 11

That, recognizing that some States had not adequately complied with safety management provisions, the Regional Office advise States of the Asia/Pacific Region that further regional implementation of reduced separation minima should only proceed in circumstances where implementing States can demonstrate an ability to comply with Annex 11, Chapter 2, safety management provisions for the continuous monitoring and regular assessment of the safety level achieved.

Conclusion 16/6 – Non Provision of safety related data by States

That the Regional Office advise that States not providing safety related data to approved regional safety monitoring agencies, including RMAs, in accordance with the requirements of safety monitoring agencies will be included in the APANPIRG List of Deficiencies in the ATM/AIS/SAR fields.

2.25 In reviewing the work of APANPIRG/16, RASMAG/4 agreed to add an item to the task list that would ensure that RASMAG routinely considered circumstances involving the non-provision of safety related data by States, with a view to identifying States that were not providing data and recommending to APANPIRG that they be included on the Deficiencies list.

Safety Contact Point

2.26 In an effort to addressing regional deficiencies and, in particular, to provide a safety contact point in each State who would respond in a timely and effective manner in addressing operational deficiencies notified by operators, APANPIRG/16 adopted the following Conclusion:

Conclusion 16/62 – State focal point for safety-related activities

That, Asia/Pacific States notify to the Regional Office by the first quarter of 2006 a responsible contact officer or position to act as a focal point for safety related activities and in particular for the submission and coordination of ATS incident reports.

2.27 RASMAG/4 agreed that the establishment of these arrangements should be completed as soon as possible and requested that the Regional Office alert States by letter to this Conclusion and actively seek contact details for a safety contact person. The Regional Office also agreed to routinely raise the list of safety contacts as a working paper to ICAO regional ATM meetings to enable the list to be kept up to date.

Outcomes of the 42nd DGCA Conference

2.28 The 42nd Conference of Directors General of Civil Aviation, Asia and Pacific Regions (42nd DGCA Conference), was held at the Gold Coast, Australia, from 26-30 September 2005. The meeting was briefed regarding the activities of the Conference and noted the following:

- a) The 42nd DGCA Conference was informed about the progress of the RASMAG and the fact that the application of RVSM and other reduced separation minima were predicated on safety assessments having met the target level of safety was strongly emphasized;
- b) The Conference was advised that the problems in respect of the provision of safety data discussed at the Conference last year remained. In particular, although follow up actions had been continually undertaken by the ICAO Regional Office and regional RMAs in an effort to ensure States provided suitable safety data, some States had still not provided data;
- c) The Conference was informed that APANPIRG had noted that the expertise and mechanisms for the funding of multinational infrastructure and services required for safety monitoring activities were not readily available in most States in the Asia/Pacific region. Accordingly, APANPIRG/16 had decided to form a study group comprised of appropriate experts to recommend a proposal to assist States to organize and finance the mechanisms for provision of safety services. Directors General were urged to commit the expertise to participate in the study group in order to develop appropriate and sustainable mechanisms to organize and fund necessary safety monitoring services;
- d) A workshop in relation to Safety Management Systems (SMS) was held was held during the Conference, moderated by the Director of the ICAO Air Navigation Bureau. The workshop agreed that the Regional Office in coordination with States would scope a project on the implementation of SMS in the Region; and

- e) As some States had extensive experience with SMS, these States reiterated their full willingness to share this experience and provide assistance. The Conference took note of the SMS Workshop to be organized by Hong Kong (China) in close coordination with the Regional Office during 2006.

2.29 The 42nd DGCA Conference endorsed a total of 11 Action Items, including the following Action Item of relevance to the work of RASMAG:

42nd DGCA Conference Action Item 42/4

Recognizing the ICAO provisions on implementing Safety Management Systems, the Conference urged all Administrations in the Asia Pacific Region to fully support the project on SMS and the APANPIRG Regional Airspace Safety Monitoring Advisory Group (RASMAG) by providing safety data in a complete and timely manner as well as to support the initiatives by APANPIRG to devise sustainable funding arrangements.

Agenda Item 3: Airspace safety monitoring documentation and regional guidance material

Safety Monitoring Agency (SMA) Handbook

3.1 The United States and Australia presented the meeting with a draft of A Handbook to Guide Monitoring in the International Airspace of the Asia/Pacific Region in Connection With Introduction and Continued Safe Use of an Horizontal-Plane Separation Minimum Where Required Navigation Performance (RNP) Is Applied. This handbook (Appendix XX refers) was developed in order to standardize the principles and practices of SMAs, which are responsible for the safe application of reduced horizontal separation standards in international airspace. It was intended that this handbook would introduce a common set of principles and practices for monitoring in connection with horizontal-plane minima based in part on application of performance-based separation. The handbook would also help to promote an exchange of information among different regions in order to achieve common safety monitoring procedures.

3.2 The draft handbook provided a detailed description of duties and responsibilities of an SMA and proposed working principles common to all SMAs. It described the establishment and maintenance of an RNP approvals database and recommended the need to exchange this information with other SMAs. The steps necessary to monitor horizontal-plane performance were explained, including monitoring the occurrence of large height deviations, conducting safety assessments and monitoring results.

3.3 The meeting agreed that time would be needed to review the draft handbook in detail and to consult with other experts before providing comments to the authors. It was therefore requested that the Regional Office provide electronic copies of the document in Word format to all participants. Comments and recommendations should be provided by e-mail to Leslie McCormick before 15 December 2005. The task list was updated in this respect.

Review of RASMAG/3 ATS Safety Management Seminar

3.4 In considering the development of safety management systems in the Asia and Pacific Region, RASMAG/1 & 2 agreed that more attention needed to be given to education, and commenced planning for an ICAO ATS Safety Management Seminar with a focus on practical hands-on experience.

3.5 The 3-day RASMAG ATS Safety Management Seminar was conducted from 8 to 10 June 2005 at the ICAO Asia/Pacific Regional Office, immediately following the RASMAG/3 meeting. A copy

of the seminar programme has been included in the **Appendix C** for review. Additionally there was continued agreement at RASMAG/3 that, although resource constraints were such that the proposal to take the safety seminar developed by RASMAG on-site to specific States was not possible, this proposal should continue to be pursued by RASMAG. As such, RASMAG/3 recognized that the initial safety seminar would comprise a trial and evaluation of the safety presentations, and that the material presented would need to be formally evaluated in respect of relevance and suitability, before being compiled for further use. RASMAG/3 added an action item to the RASMAG task list to ensure that a review of the seminar was conducted during RASMAG/4.

3.6 In view of the time constraints experienced during RASMAG/4, the meeting agreed to review the seminar programme ‘off-line’ and provide feedback to the Regional Office in respect of the seminar topics that should be retained or developed for further delivery. The meeting recognized that a training aid that could be delivered over a period of two days was the most appropriate and agreed that the three day seminar programme should be edited to meet this criterion. The meeting updated the task list to ensure that the Regional Office would circulate the seminar programme to meeting participants as soon as possible, and the feedback should be received by the Regional Office by 15 December 2005. The meeting also agreed that this material should subsequently be made available to the team scoping the SMS project proposed by the 42nd Conference of Directors General.

Guidance Material for Data Link Ground Equipment

3.7 Representatives from Japan and New Zealand co-presented preliminary draft guidance material relating to Data Link Ground Equipment. This material had been developed following RASMAG/3 (June 2005), and was focused on three primary areas:

- a) System Procurement Processes;
- b) Implementation of Systems; and
- c) The Integration of data Link Systems.

3.8 Each of these areas was presently covered in a separate document, which contained detailed information about each topic, including the objective of the guidance, processes relating to the subject matter, specifications and testing and commissioning considerations.

3.9 In considering the structure of the guidance material, the meeting considered that as the guidance material was being prepared to assist States that were new entrants to data link technologies, it was important that the document be straightforward and easy to follow. The meeting favoured a single document with as much duplication removed as possible, and appendices containing the specific technical details relevant to each area. It was also suggested that the guidance material contain diagrams and charts where appropriate to convey information and reinforce the textual message.

3.10 The meeting recognized that the volume and complexity of the material did not facilitate a substantive review during the meeting. Accordingly, the Regional Office was requested to circulate the material via email for further study by participants. This will allow each participant to enter comments directly into the document and return them electronically to the primary authors – Mr. Y. Nakatsuji, Mr H. Matsuda (Japan) and Mr. T Farmer (New Zealand). The meeting noted that a target date for the completion of this activity was to be the 15th December 2005, and that this activity would be updated in the RASMAG task list.

Agenda Item 4: Review the airspace safety monitoring arrangements in the Asia/Pacific Region and the activities of regional airspace safety monitoring agencies

Report of MAAR's RMA activities

Bay of Bengal

4.1 The Monitoring Agency for the Asia Region (MAAR) presented a report on their review of airspace safety for the RVSM implementation in the Asian region. In respect to the Bay of Bengal area, MAAR noted that a large majority of States had provided the required Traffic Sample Data (TSD) for analysis, however there were still some States that had not provided LHD data and these were being followed up by MAAR.

4.2 The LHD occurrences in the BOB RVSM airspace were summarized as follow:

- Total of 6 LHD occurred in the BOB RVSM airspace, accounting for 24.4 minutes of operational errors, between January 2004 and August 2005.
- 50% of LHD occurrences are subject to ATC loop error (Category I) – 3 of 6 LHD occurrences
- The rest of the LHD occurrences are subject to:
 - o Deviation due to turbulence or other weather related cause (Category D)
 - o Other (Category O)

4.3 The meeting was informed that in the BOB airspace, the technical risk was calculated as 6.14×10^{-10} and the operational risk as 2.67×10^{-9} . The total risk was assessed as 3.29×10^{-9} , therefore current estimates of both technical and total risks satisfy the agreed TLS value of no more than 2.5×10^{-9} and 5.0×10^{-9} fatal accidents per flight hour respectively.

Source of Risk	Lower Bound Risk Estimation	TLS	Remarks
Technical Risk	6.14×10^{-10}	2.5×10^{-9}	Below Technical TLS
Operational Risk	2.67×10^{-9}	-	-
Total Risk	3.29×10^{-9}	5.0×10^{-9}	Below Overall TLS

Western Pacific/South China Sea

4.4 MAAR informed the meeting that in the case of the Western Pacific (WPAC) and South China Sea (SCS) airspace there were significant issues regarding the lack of Traffic Sample Data (TSD) provision by 5 of 15 FIRs which impacted on the level of confidence that could be placed in the results of the safety assessment. In an effort to enhance the integrity of the assessment, Traffic Sample Data from 2002 for the 5 FIRs was utilized to fill in the missing data.

4.5 The LHD occurrences in the WPAC/SCS RVSM airspace are summarized as follow:

- Total of 86 LHD occurred in the WPAC/SCS RVSM airspace, accounting for 141.9 minutes (2.365 hours) of operational errors, between January 2004 and August 2005.
- 86% of LHD occurrences are subject to errors in ATC-unit to ATC-unit transferred/transition message (Category M) – 74 of 86 LHD occurrences

- The rest of the LHD occurrences are subject to:
 - o Climb/descend without ATC Clearance (Category B) – 1
 - o Deviation due to turbulence or other weather related cause (Category D) – 2
 - o Deviation due to collision avoidance system advisory (Category F) – 1
 - o ATC system loop error (Category I) – 5
 - o Other (Category O) – 3

4.6 The meeting was informed that the technical risk for the WPAC/SCS area was calculated as 3.97×10^{-10} and the operational risk as 3.06×10^{-9} . The total risk was assessed as 3.46×10^{-9} , therefore current estimates of both technical and total risks satisfy the agreed TLS value of no more than 2.5×10^{-9} and 5.0×10^{-9} fatal accidents per flight hour respectively.

Source of Risk	Lower Bound Risk Estimation	TLS	Remarks
Technical Risk	3.97×10^{-10}	2.5×10^{-9}	Below Technical TLS
Operational Risk	3.06×10^{-9}	-	-
Total Risk	3.46×10^{-9}	5.0×10^{-9}	Below Overall TLS

4.7 IFALPA noted and commended the increased participation of States in providing safety related data for analysis. However IFALPA was concerned that the numbers of vertical operational errors identified in the Arabian Sea and WPAC/SCS airspace were not consistent with the actual number of LHD occurrences, as some pilot reports received by IFALPA did not appear to be recorded in the LHD statistics.

4.8 In considering this issue, the meeting noted that it was the responsibility of the States under safety management provisions to comply with the requirement of MAAR to report all LHDs that occurred in their airspace and urged States to review existing processes to ensure that this was the case. In addition, a robust and reliable reporting methodology needed to be implemented to ensure that the missing events were thoroughly captured. The meeting requested that the Regional Office include this matter on the agenda of the next RVSM/TF for further study.

4.9 The meeting thanked MAAR for the excellent assessment work undertaken in reviewing the BOB and the WPAC/SCS and for again bringing the issues related to a lack of data to RASMAG's attention. The meeting once again strongly endorsed the recommendation made to States by MAAR regarding the need to mitigate identified LHD occurrences of the type M category, noting that APANPIRG/16 had established Conclusion 16/3 requiring the Regional Office to draw the attention of affected States to this situation and Conclusion 16/6 requiring that States that did not provide safety related data in accordance with the requirements of regional safety monitoring agencies be included on the APANPIRG List of Deficiencies.

Establishment of Safety Monitoring Agency (SMA) for the Asia Region

4.10 The meeting recalled that Thailand's (MAAR) intentions to assist States of the region and ICAO in the safety monitoring of RNP-based horizontal-plan separation minimum application in the Asia Region in addition to existing RMA functions were discussed during RASMAG/3. MAAR had reported that in order to expand its role to provide SMA services in addition to the RMA services currently provided at no charge, MAAR would require financial support on a cost-recovery basis. RASMAG/3 had expressed appreciation for MAAR's existing RMA work and encouraged MAAR to pursue its present initiatives to provide SMA services.

4.11 During APANPIRG/16, MAAR also reconfirmed the willingness to assume the additional safety monitoring responsibilities as an organization approved by regional agreement to provide airspace safety services in international airspace of the Asia/Pacific Region for the implementation and operation of reduced horizontal separation. In this regards, MAAR requested the support of other concerned States in financing such expansion.

4.12 Thailand updated RASMAG/4 in respect of the progress being made towards the establishment of a SMA for the Asia Region, following up MAAR's intention to fulfill the role of SMA to support the implementation of RNP-based horizontal-plane separation minima in the Asia Region in addition to its current RMA duties. Thailand reported that they had undertaken consultation with the FAA Technical Center regarding the possibility of transferring the technical knowledge for the implementation and operation of reduced horizontal separation. These consultations had been positive and the FAA confirmed that they were willing to provide the required technical support and training for the MAAR personnel to be able to carry out the SMA services.

4.13 Given the technical capability and prior experience of the RMA for the RVSM implementation in the Asia Region, MAAR proposed the action plan for the establishment of SMA services provided in **Appendix D**. MAAR also advised the meeting that, although the technical aspects of assessing risks for the implementation of RVSM and RNP-based horizontal-plane separation minima were similar, a number of different aspects would need to be reviewed. Hence, two training phases were proposed to ensure the quality of the SMA services. The programme for the first phase has been provided in **Appendix E**, while the programme for the second phase would be determined at a later stage. The meeting recommended that management of crossing tracks and longitudinal considerations be included in the first phase of training.

4.14 In order to ensure that there was minimal delay in the commencement of SMA operations, Thailand advised RASMAG/4 that it was their intention to advance the initial set-up costs for the setting up of the SMA. However, cost-recovery funding arrangements would need to be considered to recover the initial setup costs as well as ongoing operations. Thailand estimated that the costs involved would be in accordance with the details in the following table:

Cost Items	Estimated Cost (US Dollar)	
	Initial Setup (2006-07 Combined)	Per-Year After Initial Setup (Starting 2008)
Setup Cost-Training	40,000	-
Setup Cost-System and Equipment	10,000	-
Operating Cost-Coordination/Task Force Meetings	25,000	40,000
Staff Wages	80,000	60,000
Total cost	155,000	100,000

4.15 The total costs shown above represent all of the expenses expected to be incurred in the establishment and ongoing operation of the SMA, including the setup, operating (meeting and coordination) expenses, and staff-wage costs.

4.16 In considering the proposal from Thailand, the meeting recalled that RASMAG/1 (April 2004) had identified and reported to APANPIRG/15 (August 2004) that formal arrangements to establish a safety monitoring group to carry out monitoring services and safety assessments for implementation and operation of reduced horizontal separation were required for the reduced horizontal separation applications in the South China Sea, Bay of Bengal and EMARSSH route structures. However, SMA services were still not regionally available in this respect.

4.17 In respect of the cost and complexities of funding the SMA as proposed by Thailand, the meeting noted the arrangements that had recently been agreed by the Middle East States in respect of operating and RMA, as discussed at Agenda Item 7 (“Funding of Regional Safety Monitoring Activities”).

4.18 With reference to the process to authorize the SMA, the Regional Office noted that, in accordance with its procedures, APANPIRG would need to designate the SMA as an “approved regional SMA” and that support for the Thailand proposal should be gained from the respective ATS Coordination Group and the ATM/AIS/SAR Sub Group in order to ensure that an appropriate recommendation was put to APANPIRG. The meeting commended MAAR on its performance as an RMA and considered that it was likely that any additional services provided by MAAR could reasonably be expected to be of a similar quality.

4.19 In noting expressions of support from a number of States represented at the meeting, including Australia, Hong Kong China, India, Japan, Singapore and the United States, as well as the Regional Office, RASMAG again supported the initiatives of Thailand and encouraged MAAR to proceed in accordance with the proposal as presented to the meeting. The SMA services in the Asia Region were very limited and having ready access to an SMA would greatly assist States in meeting their obligations in respect of ICAO safety provisions.

Agenda Item 5: Review of regional safety assessment activities/requirements

RVSM Pre-Implementation and Transition in Japan

5.1 Japan reported that RVSM was implemented in the Japanese domestic airspace on 29 September 2005 as planned. The transition from CVSM to RVSM commenced at 1900 UTC on that date.

5.2 The meeting noted that Japan Civil Aviation Bureau (JCAB) hosted the Twenty-Sixth meeting of RVSM Task Force (RVSM/TF/26) in Tokyo from 4 to 8 July 2005. The RVSM/TF/26 agreed that RVSM should be implemented in the domestic airspace of Tokyo and Naha FIRs of Japan, and Incheon FIR of the Republic of Korea, after reviewing readiness states reported by both States.

5.3 The meeting also noted that JCAB had regular meetings with the Self Defense Forces and agreed on principles for safe operations in the RVSM airspace. Similarly, JCAB and US Forces in Japan reached agreements to safeguard procedures for RVSM operations.

5.4 Japan reported that an amendment to the existing AIP relating to RVSM operations to cover the domestic RVSM operations with effective from 1900 UTC on 29 September 2005 was published on 4 August. All Japanese operators who wish to operate in RVSM airspace received operational approvals for their domestic fleets by 29 September; as a result, nearly 100% of IFR flights in the domestic RVSM airspace were conducted by RVSM certified aircraft after the implementation.

5.5 The meeting recalled that the RASMAG/3 (June 2005) was advised that JCAB had established the Airspace Safety Monitoring Unit (JSMU) in April 2004, and had conducted preliminary assessment required for the domestic RVSM implementation. The final pre-implementation safety assessment was presented to the RVSM/TF/26. Table 1 below provides estimates of technical risk, operational risk and overall risk, calculated for Japanese domestic airspace.

Source of Risk	Lower Bound Risk Estimation [accidents / flight hour]	TLS [accidents / flight hour]	Remarks
Technical Risk	1.5×10^{-9}	2.5×10^{-9}	Below Technical TLS
Operational Risk	2.6×10^{-9}	-	-
Overall Risk	4.1×10^{-9}	5.0×10^{-9}	Below Overall Risk

Table 1: Risk Estimates for the RVSM Implementation in the Japan domestic airspace

5.6 JCAB advised the RASMAG/3 that the results of the safety assessment met the requirements and concluded that RVSM in the Japan domestic airspace could be safely implemented on 29 September 2005.

5.7 RVSM/TF/26 had also reviewed the safety assessment undertaken by MAAR for the Japan and Republic of Korea RVSM implementation, and confirmed the risk estimates met the target level of safety, as shown in Table 2 below.

Source of Risk	Lower Bound Risk Estimation [accidents / flight hour]	TLS [accidents / flight hour]	Remarks
Technical Risk	1.40×10^{-9}	2.5×10^{-9}	Below Technical TLS
Operational Risk	2.43×10^{-9}	-	-
Overall Risk	3.83×10^{-9}	5.0×10^{-9}	Below Overall Risk

Table 2: Risk Estimates for the RVSM Implementation in Japan/Republic of Korea Airspace

5.8 Japan reported that JCAB had developed the DRVSM Transition Manual, which specified points of contact of relevant facilities, communication/reporting procedures, roles and responsibilities of HQ and ATC facilities, transition concepts, time-sequenced transition timeline, transition readiness check-lists, and contingency plans.

5.9 The meeting noted that the RVSM implementation had gone ahead very smoothly and all participants congratulated Japan for the conscientious preparation that had enabled this to occur. IATA noted the many difficulties that had been encountered and overcome in preparing for this implementation and reported that since implementation, no complaints or queries had been received from operators. IATA, in noting the benefits that would accrue to operators, thanked and congratulated Japan for their work. The Regional Office noted that the implementation in the Republic of Korea also had gone smoothly and, in noting that this completed RVSM implementation in the international oceanic airspaces of the region, thanked both Japan and Republic of Korea for their efforts.

United States FAA Ocean21 System

5.10 The Federal Aviation Administration (FAA) presented information on the Advanced Technologies & Oceanic Procedures (ATOP) Ocean21 Flight Data Processing (FDP) System. The Ocean21 system was implemented into the New York FIR on 6 June 2005 and into the Oakland FIR on 17 October 2005. The initial implementation for the Anchorage FIR is planned for March 2006.

5.11 Ocean21 is an ICAO compliant FDP system which includes the following integrated tools:

- System-maintained electronic flight data;
- Electronic flight strips;
- Controller Pilot Data Link Communications (CPDLC);
- Air Traffic Services Inter-facility Data Communications (AIDC);
- Automatic Dependant Surveillance (ADS);
- Automated conflict detection (aircraft and airspaces);
- Conflict probe;
- Radar Data Processor (RDP);
- Workload Management; and
- Dual-channel architecture supporting 24/7 Operations.

5.12 Some of the benefits of the Ocean21 system include:

- Increasing the opportunity for long haul oceanic flights to fly preferred fuel saving tracks;
- Increasing flight profile predictability and reliability, thereby potentially increasing cargo revenues;
- Providing greater flexibility and responsiveness to in-flight requests through timely, reliable satellite data communications enabling additional cost savings and benefits;
- Automating manual processes thereby freeing air traffic controllers to respond to pilot requests;
- Improving safety by reducing the chances of pilot-controller miscommunications;
- Organizational benefits through the implementation of common systems, procedures, training and support for all three oceanic centers;
- Increasing airspace efficiency by enabling the implementation of reduced separation standards.

5.13 The Ocean21 system allows the FAA to implement reduced aircraft separation standards and increase operational efficiency whilst maintaining or enhancing the level of safety.

Implementing 30NM Lateral and Longitudinal Separation Standards (30/30) in Oakland FIR: Preliminary Safety Assessment

5.14 The FAA presented information on the preliminary safety assessment underway in preparation for the implementation of 30/30 in the Oceanic Control Sector 3 (OC3) of the Oakland FIR. A copy of the presentation is at **Appendix F**. The target date for introduction of the operational trial is 22 December 2005.

5.15 During this trial, 30/30 separation will be applied to suitably approved pairs of aircraft within the airspace after successful outcome of pre-trial safety assessment in order to gain practical experience with use of the new standards, gather sufficient empirical evidence to confirm positive indications of safety assessment and monitor operations until FAA regulatory authorities are convinced that new separation minima may be extended safely to other portions of the Oakland FIR.

5.16 In conducting the safety assessment, the FAA reviewed the predominant traffic flows, which include the ATS routes and user preferred routes between the U.S. West Coast and South Pacific States, and the southern three routes of Central East Pacific (Hawaii/West Coast of North America) track system.

5.17 The FAA Technical Center, in its role as Pacific Approvals Registry and Monitoring Organization (PARMO) maintains a database of aircraft approved for required navigation performance (RNP). PARMO has requested relevant State authorities to determine which aircraft and operators in OC3 meet the requirements for 30/30 – those having RNP-4 approval without time limit and FANS-1/A package. Based on the information received, 30/30 will be applied only to traffic between KLAX/KSFO and NZAA/NZCH---YSSY/YMML/YBBN.

5.18 The FAA overall safety assessment approach is to use an ICAO-endorsed collision risk methodology to demonstrate that risk upon introduction of 30/30 will satisfy a target level of safety (TLS) of 5×10^{-9} fatal accidents per flight hour due, separately, to the loss of 30NM lateral and 30NM longitudinal separation, following the prescriptions of Annex 11.

5.19 The application of 30/30 separation standards marks the first inclusion of tactical air traffic control, or the controller decision support system, in the estimation of risk associated with en route separation minima. However, in performing the safety assessment, the FAA is estimating risk for loss of each separation standard as if the airspace were managed in a strictly strategic manner, without the decision support aids of Ocean21.

5.20 The use of UPRs in the airspace further complicates the safety assessment process by making the collision risk model developed to estimate lateral risk for parallel-route operations difficult to apply.

5.21 Parameters for lateral and longitudinal risk models were chosen which were established values from Pacific or North Atlantic, where appropriate; reflect Boeing 747-400 aircraft size; and result from processing flight plan, controller-pilot data link communication (CPDLC) and radar data from September 2004 through August 2005, plus all available Ocean21 data from the Oakland FIR – with special emphasis on OC3 operations. Information was collected from the FAA Enhanced Traffic Management System (ETMS), radar data and Ocean21 data.

5.22 The first requirement is to show that the lateral risk satisfies the TLS (and, therefore, the operational trial may go forward) in accordance with Annex 11, Attachment B, Table B-1. Secondly, the analysis of traffic flows indicates that the lateral risk for flows in OC3 can be bounded from above by assuming all operations are at the same altitude on a single pair of parallel routes. The FAA has modified assumptions underlying Table B-1 to produce more stringent large-error frequency requirements for a single pair of parallel, same-direction routes. The analysis needs to meet requirement that frequency of 15NM or greater lateral deviations does not exceed the range 0.5 to 1.0×10^{-4} .

5.23 In performing the assessment of lateral risk, one problem is that the RNP-4 approval process only recently became available. There are roughly 2 000 radar-based observations of lateral errors for OC3 aircraft, all of which are less than 15 nm in magnitude. Approximately 10 000 observations of OC3 lateral errors are needed in order to conclude with high confidence that the requirement for frequency of lateral deviations is met. One solution is to do sequential sampling of OC3 lateral errors during the operational trial in order to establish satisfaction of the requirement with high confidence.

5.24 The preliminary analysis of traffic flows indicates longitudinal risk for flows in OC3 can be bounded from above by assuming all operations are on a single route at a single flight level. The FAA has identified (conservative) initial distribution of aircraft-pair along-track separations from OC3 traffic data and determined the distribution of conservative gain/loss in longitudinal separation for operations within airspace.

5.25 Preliminary Risk Estimates:

1. OC3 demand-for-service profiles and flight plans suggest that lateral risk can be bounded by assuming a single pair of parallel routes with lateral occupancy of 0.5 to 0.7 (required proportion of 15NM or greater lateral errors in range of 0.5 to 1.0×10^{-4}). Since the RNP-4 approval process had only recently been published, the limited time since implication had resulted in an absence of available data for analysis, with the result that this requirement cannot be demonstrated before the start of the operational trial. In support of the start of the operational trial, experience shows that GPS-based lateral navigational performance in oceanic airspace was demonstrably capable of meeting requirement.
2. OC3 demand-for-service profiles and flight plans suggest that longitudinal risk can be bounded by assuming that all operations are conducted at same altitude on a single route. Distribution of initial longitudinal separation is rectangular between 30NM and 40NM with total density of 0.4 between these bounds. Loss or gain in separation is less than 2 minutes in magnitude with probability 0.95. Controller intervention to maintain separation required only in rare instances.

5.26 The FAA expects to complete the safety assessment risk calculations by early November, with the outcome expected to show the satisfaction of TLS in lateral and longitudinal dimensions. It is anticipated that FAA Flight Standards will review of safety assessment shortly thereafter.

5.27 The FAA Technical Center plan to support the operational trial includes extensive data collection and analysis, in the manner of the monitoring agency, in order to support decision to transition from operational trial to fully operational use of 30/30.

5.28 The FAA will keep RASMAG informed of further activities.

5.29 The meeting thanked the FAA Technical Center for their informative presentations on Ocean21 and their plan for safety analysis and assessment to support the introduction of 30/30 operational trials in the Oakland FIR. In addition to the mathematical safety assessment, the FAA is performing a hazard analysis and following the model used by Australia and New Zealand which was endorsed by APANPIRG/16 in Conclusion 16/12. FAA will submit the safety assessment and plan for post-implementation monitoring to the ICAO Asia Pacific Regional Office prior to beginning the operational trials. The meeting commended and supported the comprehensive and detailed approach adopted by the by the FAA in the conduct of this safety assessment.

South-East Asia - ATS Safety Management SIP

5.30 The Regional Office gained approval from the Council for a SIP during 2005 to undertake an evaluation of States in the Asia Region in relation to the status of their ATS safety management programmes necessary for implementation and operation of RVSM, reduced horizontal separation minima based on RNP and data link applications in the FIRs concerned. The SIP was conducted during 2005 and focused on Cambodia, Indonesia, Philippines and Viet Nam.

5.31 The objective of the SIP was to ensure that all concerned States had implemented proper mechanisms to ensure the safe implementation and operation of RVSM and reduced horizontal separation under Annex 11 provisions, and to assist States as necessary to draw up an action plan with a view to meeting their obligations thereto. A similar SIP conducted by the Regional office in 2004 covered a number of States in the Bay of Bengal area and included consideration of operational safety matters.

5.32 The SIP mission, in its discussions with the States concerned, noted that ICAO compliant safety management systems had not been fully implemented by any of the four States visited and that States were at various stages of developing their strategy and implementing changes to their existing safety management practices.

5.33 The SIP mission identified several important issues regarding the capability of some of the States to implement and operate ICAO compliant safety management programmes. Accordingly, full and comprehensive Country reports have been provided by the Regional Office to the States involved in the SIP, including appropriate prioritized recommendations and actions for improvement. In general terms, the SIP mission considered that:

- None of the States visited had in place ICAO compliant safety management programmes, however all States were at various stages of evaluation of the ICAO requirements and some were involved in planning partial implementation;
- All of the States understood the necessity to implement the ICAO requirements and generally were eager to improve their overall safety management arrangements, but all required various levels of assistance. In particular, assistance from ATS safety management experts would be necessary to further develop safety management arrangements, including the performance of safety assessments, establishment of acceptable levels of safety and the training of in-house experts;
- A number of States appeared to be experiencing serious institutional problems, including non-provision by government of appropriate organizational arrangements, inadequate follow up and remediation of aircraft incidents and ATS safety related occurrences, and administrations seriously under resourced and lacking safety management expertise;
- The RASMAG plan to take safety management workshops to States was an excellent proposal deserving full support. Unfortunately resource issues mean that the safety management workshops would not be held and therefore means to obtain funding for these activities should be actively pursued; and
- The ICAO Regional Office should continue to give the highest priority to States implementing the ICAO safety management programmes as safety problems were evident in most of the States visited. It would also be advisable to develop a regional priority list of States that required assistance.

5.34 One of the tasks of the SIP mission was to consider a regional strategy for implementation of safety management programmes. Regrettably, there was insufficient time to pursue this matter in detail. The States visited were at various levels of capability and there was no one solution that fitted all cases. The SIP mission considered that the development of a strategy perhaps should be placed on the RASMAG work programme as the mission considered this fell within the RASMAG objectives and terms of reference.

5.35 As a result of discussions in relation to these matters by APANPIRG/16, the following

conclusions were adopted:

Conclusion 16/18 — Assistance to States to develop safety management systems

That, recognizing that many States in the Asia/Pacific Region require assistance to implement safety management programmes in accordance with Annex 11, States with expertise in implementing and operating ICAO compliant safety management systems inform ICAO by end of 2005 of their willingness to participate in a series of seminars/workshops to be arranged by ICAO during 2006-2007 to assist States.

Conclusion 16/19 – Study of States' preparedness to implement safety management systems

That, a study of States' preparedness to implement ICAO safety management systems in accordance with Annex 11 be undertaken by the Asia/Pacific Regional Office in conjunction with the ATS coordination groups and RASMAG by the first quarter of 2006, and a plan of action developed to be reported to APANPIRG/17 in September 2006.

5.36 In considering the matters raised, RASMAG/4 expressed in-principle support for the matters raised by the SIP and the APANPIRG Conclusions. However, in respect of Conclusion 16/19 and the proposals arising from the SIP mission, the meeting recalled that RASMAG had been established with objectives to:

- a) facilitate the safe implementation of reduced separation minima and CNS/ATM applications within the Asia and Pacific Regions in regard to airspace safety monitoring; and
- b) assist States to achieve the established levels of airspace safety for international airspace within the Asia and Pacific Regions.

5.37 Accordingly the meeting considered that matters raised by the SIP and APANPIRG Conclusions 16/18 and 16/19 were perhaps outside the primary scope of RASMAG and that it was probably beyond the very limited resources available to RASMAG to expand its work programme in this manner.

5.38 The meeting, recognizing the complex and diverse issues that were involved, discussed ways to best achieve an improvement in the safety management performance of States. India noted that there were already a number of different ICAO mechanisms in place, including the USOAP audit program, the regular Regional Office meetings, the APANPIRG deficiencies list and the work already completed by RASMAG. The meeting felt that it was a very high priority to ensure that the most effective use was made of increasingly limited resources.

5.39 The meeting recognized that common to all these approaches was the primary responsibility, in terms of the Chicago Convention, held by States for safety management. The meeting further recognized that a common thread regionally was that there was often a lack of empowerment or ability in terms of appropriate State primary legislation and institutional arrangements that would enable administrations to continuously and coherently develop and implement safety management systems. The meeting was therefore of the opinion that a holistic and concentrated approach to these matters that was enabled and driven by the highest offices and officials in State administrations would provide the most effective solutions, rather than the multi-faceted approaches that were presently characteristic of the region.

5.40 In this context, the meeting commended the work of APANPIRG and the Directors General of Civil Aviation in comprehensively considering these issues during the APANPIRG/16 meeting

and 42nd Conference of Directors General of Civil Aviation held this year. The meeting applauded the decision by the 42nd Conference of Directors General, reached as a result of discussions during the workshop in relation to Safety Management Systems, that the Regional Office, in coordination with States, would scope a project on the implementation of SMS in the Region.

5.41 The meeting was of the opinion that such a project would provide an effective way to address the issues raised in the SIP and in the related APANPIRG Conclusions. In addition, the work already completed by RASMAG by way of the conduct of an ATS Safety Management Seminar would be relevant to the project and would perhaps serve as the basis of a safety management training programme. RASMAG agreed to continue with its review of the seminar topics in accordance with the task list, in order to ensure that this material was available to the project. The Regional Office undertook to consolidate relevant material from RASMAG discussions and ensure that this material was brought to the attention of the project scoping team.

Acceptable Level of Safety with airspace of Hong Kong, China.

5.42 Hong Kong, China presented information on the methodology used by the Civil Aviation Department (CAD) of Hong Kong, China, regarding proposed Acceptable Level of Safety (ALOS) for use in the provision of Air Traffic Service within the Airspace of Hong Kong, China.

5.43 The CAD utilize a risk tolerability principle, which results in the proposed ALOS being represented in the form of a risk matrix containing both qualitative and quantitative values. The ICAO definitions of aircraft proximity (Doc 4444, page 1-2) have been coded as Categories A to D and adopted for the purpose of classifying the level of risk of an incident, with the required actions resulting from the risk assessment also listed.

5.44 Descriptions for ATC incidents are included for aircraft under radar and procedural control, as well as aerodrome control. The paper also detailed the future plan for the development of other specific ALOS; such as runway incursions and level busts. These are expected to be developed after more experience is gained in this area, and will increase the level of risk assessment and monitoring in air traffic management.

Agenda Item 6: Review and update RASMAG Task List

6.1 In reviewing the RASMAG task list, the meeting was appraised of the status of items remaining open, noting the progress that had been made. The meeting considered that there were benefits in adopting a numbering system for task list items that included the meeting number, as well as the sequence number of the task, in a similar manner to the method adopted by APANPIRG for numbering of Conclusions and Decisions. The Regional Office agreed to review previous RASMAG task lists, renumber tasks in accordance with the above method and present a consolidated task list for review by RASMAG/5.

6.2 The meeting reviewed and updated the RASMAG task list, as shown in **Appendix G**, and agreed that this met the work programme of the group.

Agenda Item 7: Funding of Regional Safety Monitoring Activities

7.1 In considering the funding of regional safety monitoring activities, the meeting noted that the primary reason for establishing such multinational facilities or services is to enable two or more States to carry out the services each has responsibility for under the regional plan more efficiently and in a more cost effective manner than each of them could achieve on its own. The Secretariat drew attention to the basic financial and legal implications that need to be considered in establishing multinational facilities and services and welcomed discussions at this meeting that would assist progress to be made on financing aspects.

APANPIRG Funding Study Group

7.2 The meeting was informed that APANPIRG, at its 16th Meeting held from 22 to 26 August of this year, recognized an urgent need to develop feasible and sustainable funding solutions for regional safety monitoring so that on-going initiatives to carry out trials and to implement CNS/ATM systems in Asia/Pacific would not be delayed and that safety and efficiency were not compromised. APANPIRG's CNS/ATM technical experts had previously found it difficult to resolve the complex legal, financial and organizational issues involved in establishing a regional safety monitoring agency. Recalling this experience, the meeting considered that the matter of funding and organizing safety monitoring should be addressed by States' experts in these specialist fields. APANPIRG/16 thus agreed to the following Conclusion:

Conclusion 16/2 – Funding arrangements for regional airspace safety monitoring

That, a study group be convened to develop a feasible and sustainable proposal to equip States to organize and finance necessary safety monitoring mechanisms for the provision of safety services for the international airspaces in the Asia/Pacific region and that States be represented at that meeting by their appropriate legal, financial and organizational experts who would be best equipped and empowered to resolve any difficulties. The study group should report to RASMAG not later than the end of June 2006.

Summary of Recent Funding Activities

7.3 The matter of the funding of safety monitoring was taken up again by the Directors General of Civil Aviation in Asia and Pacific at their 42nd Conference held at the Gold Coast, Australia from 26 to 30 September. The Directors General strongly supported the work of RASMAG and adopted Action Item 42/4 urging all Administrations in the Asia Pacific Region to support the initiatives by APANPIRG to devise sustainable funding arrangements.

7.4 Work is also continuing in preparation for the ICAO ALLPIRG meeting to be held in Montreal, presently scheduled during March 2006. The matter has been included on the Agenda for ALLPIRG in recognition that issues of multinational funding are global in nature and would be best address via a model that is applicable globally. In this vein, the ICAO Air Transport Bureau is working to develop and propose a fair and equitable global method of cost recovery of the required Regional Monitoring Agency (RMA) infrastructure, for consideration by ALLPIRG.

7.5 The Regional Office has recently responded to the Air Transport Bureau survey questionnaire in this regard, providing copies of the following working papers for consideration:

- DGCA – 41/DP/5/1 – “The Regional Airspace Safety Monitoring Advisory Group (RASMAG)”

- DGCA – 42/DP/3/2 – “Provision of Safety Monitoring Services in the Asia/Pacific Region”
- APANPIRG/16 – WP/18 – “Funding Arrangements for Regional Airspace Safety Monitoring”

Review of the First Meeting of the Middle East RMA Board

7.6 The meeting recalled that prior to the 1st June 2004, the United Arab Emirates (UAE) provided full technical and financial support to the activities of the Middle East Central Monitoring Agency (MECMA), the RVSM RMA for the Middle East Region. Subsequent to 1st June 2004, the UAE withdrew support for MECMA leading to the discontinuation of monitoring mechanisms for RVSM operations in the Middle East Region.

7.7 On 9th May 2005, the ICAO Secretary General issued State Letter SWG20/1-IND/05/13, highlighting the concerns of ICAO in respect to the non-availability of RVSM monitoring in the Middle East Region and noting that unless a concrete action plan was developed by affected States, the withdrawal of RVSM operations from the MID Region would be considered by ICAO.

7.8 Subsequently, the Middle East Regional Monitoring Agency Board (MID RMA Board) was constituted and the first meeting of the Board (MID RMA Board/1) was held at Cairo, Egypt, from 5-6 September 2005. Details of the Terms of Reference and Conclusions of MID RMA Board/1 have been included as **Appendices H and I** respectively. The full report of the meeting is available on the website of the Middle East (Cairo) office of ICAO at:

http://www.icao.int/cgi/goto_m_mid.pl?icao/en/ro/mid/2005/RMA_Board1/RMA_Board1FinalReport.pdf

7.9 In addressing mechanisms to re-establish RMA services in the Middle East Region, the meeting recognized that the MID RMA Board has had to identify and put in place arrangements to host, set up, administrate and fund a RMA on behalf of the MID States. The meeting noted the simple model that had been adopted by the MID RMA Board to fund the RMA, in which the estimated USD300,000 required to establish and operate the RMA for the first year would be equally shared by the participating States under arrangements managed by the Technical Cooperation Bureau of ICAO as the collections agency.

7.10 The meeting noted the actions being taken in the Middle East Region, particularly the formation of the Middle East Regional Monitoring Agency Board, and would carefully consider how the model adopted in that case might be applied productively in Asia/Pacific. It appeared that there was significant merit in the straightforward approach adopted by the Middle East RMA Board and that this model should be considered in regional discussions relating to the funding of regional safety monitoring arrangements and brought to the attention of the APANPIRG Funding Study Group.

Agenda Item 8: Tripartite RMA Meeting

8.1 The three established regional monitoring agencies – the Monitoring Agency for the Asia Region (MAAR), Airservices Australia, and the Pacific Approvals Registry and Monitoring Organization (PARMO) – met during RASMAG/4 in order to discharge the direction given in the Report of RASMAG/3 (6 – 7 June 2005) “for the three RMAs to meet with an aim to standardize their work methods” and to harmonize “different values being used in the [collision risk] modeling,” with special emphasis on RASMAG/3 “concerns regarding the way that TCAS reports were being included [in the risk

assessment process],” additions to the RASMAG/3 text having been made in order to clarify the matters at hand. Observers from the Japan Airspace Safety Monitoring Unit (JSMU) also participated at the meeting.

8.2 The meeting considered three topics in respect of standardizing Asia/Pacific regional monitoring agency procedures:

- a) common values for risk model parameters used in safety assessments,
- b) treatment of Airborne Collision Avoidance System (ACAS) events, and
- c) operational errors.

8.3 In addition, the RMAs agreed to consider two additional topics of relevance:

- a) an alternative term for “large height deviations”, and
- b) long-term requirements for monitoring aircraft height-keeping performance.

Common Values for Risk Model Parameters

8.4 The Airservices Australia RMA informed the meeting that RVSM safety assessments in Australia use a value in the range of 60 knots for the model parameter describing the relative along-track speed of a typical pair of aircraft flying in the same direction, noting that a value of 13 knots has often been used in other safety assessments done in the Region. After exchanging views, the RMA representatives agreed that the value for this model parameter should not be fixed for use everywhere within the Region; rather the value appropriate to a particular safety assessment should reflect the range of aircraft types and speeds characteristic of the airspace under study.

8.5 During the course of deciding a common approach for determining a value for along-track speed, the RMA representatives considered several other model parameters. It was agreed that all safety assessments should use a value of 4 knots for relative across-track speed and 1.5 knots for relative vertical speed. In addition, the RMA representatives agreed that a value for the probability of lateral overlap between two aircraft on the same ground track should be determined using a common value of 0.0835 for an aircraft with wingspan of 0.0282 nm. This value should be scaled for another wingspan by determining the ratio of that wingspan to 0.0282 nm and multiplying 0.0835 by the result. The RMA representatives agreed that, in a similar manner, a value for the probability of overlap of two aircraft assigned to the same flight level applicable to a particular safety assessment should be determined using a value of 0.538 for the situation in which the typical aircraft is taken to be a B747-400 (the height of which is 63 ft 8 inches from bottom of fuselage to top of vertical tail, with landing gear retracted) scaled in the same manner as was agreed for the probability of lateral overlap.

Common Treatment of ACAS Errors

8.6 Several views were expressed regarding whether ACAS events should contribute to a risk estimate and, if so, whether that contribution should be to technical or operational risk. It was agreed that this important subject should be pursued via correspondence among the RMA representatives after RASMAG/4, with the intent of developing a common approach which would be in use prior to RASMAG/5.

Treatment of Operational Errors

8.7 It was agreed that MAAR, Airservices Australia and the PARMO had been using a common approach to treating the risk associated with errors resulting in sustained aircraft operation at a flight level other than that which was correct for the operational situation.

An Alternative Term for “Large Height Deviation”

8.8 MAAR expressed the opinion that some under-reporting of large height deviations could be due to the lack of a common understanding of the term within the Region. On the other hand, all RMA representatives agreed that the term “vertical operational errors” was widely understood to mean the sort of events about which the RMAs seek monthly reports from air traffic service providers and other organizations. As a result, it was agreed that the Asia/Pacific RMAs would adopt a more precise definition of LHD by referring to the term “vertical operational errors” for events which could have a significant effect upon vertical collision risk.

Long-Term Monitoring Requirements in the Asia/Pacific Region

8.9 The RMA representatives recalled the RASMAG/3 discussion of State Letter AN 13/31.1-04/71, the subject of which is “Proposal for amendment of Annex 6, Parts I and II and Annex 11 concerning height-keeping performance and height-monitoring requirements associated with reduced vertical separation.” The RMA representatives recalled further the change, with effect from 24 November 2005, added the following paragraph to Annex 11:

“3.3.4.1 For all airspace where a reduced vertical separation minimum of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive, a programme shall be instituted, on a regional basis, for monitoring the height-keeping performance of aircraft operating at these levels, in order to ensure that the implementation and continued application of this vertical separation minimum meets the safety objectives. The coverage of the height monitoring facilities provided under this programme shall be adequate to permit monitoring of the relevant aircraft types of all operators who operate in RVSM airspace.

Note. – The number of separate monitoring programmes should be restricted to the minimum necessary to effectively provide the required services for the region.”

8.10 The RMA representatives reviewed the Region’s current monitoring infrastructure which, it was agreed, consisted of GPS Monitoring Units and associated processing centers. It was noted that many of the aircraft conducting long-range operations within and outside of the Region were being monitored on a regular basis by ground-based systems located within Europe and/or the North Atlantic. It was further noted that the resulting estimates of altimetry system error were made available regularly to the Region’s RMAs by staff from the North Atlantic and EUROCONTROL RMAs.

8.11 However, the RMA representatives agreed that there were no comparable ground-based facilities within the Region which would produce large numbers of monitoring results on a sustained basis. The RMA representatives recalled that application of the GPS-Based Monitoring System during the various pre-RVSM-implementation activities within the Region had resulted, in most cases, in the monitoring of the minimum number of an operator’s aircraft necessary to satisfy requirements associated with obtaining State RVSM approval. As a result, there are a number of airframes, typically those of short-range aircraft types which have been operating in the Region’s RVSM airspace without ever having been monitored.

8.12 The PARMO did inform its colleague RMAs that, in its role as North American RMA, the FAA Technical Center was progressing establishment of a ground-based system which could monitor long-range aircraft operating in the northern Pacific portion of the Region. The PARMO noted that the system, consisting of a constellation of 5 Aircraft Geometric Height Measurement Elements (AGHMEs), had been developed to support North American RVSM implementation with the aim of being as inexpensive and non-complex as possible. The PARMO informed the RMA representatives that the

AGHME system is not capable of producing estimates of altimetry system error automatically in real time, as is the case with ground-based monitoring systems used in the North Atlantic and Europe. However, outputs of the AGHME system, when combined with existing Technical Center software and procedures, could produce such estimates in considerable volumes.

8.13 The RMA representatives agreed that the new, regionally focused height-keeping performance monitoring requirements of Annex 11 required urgent attention, given their effective date of 24 November 2005. It was, therefore, agreed that the Regions RMAs would coordinate planning in advance of the Fifth Meeting of the RASMAG in order to present a Regional monitoring plan consistent with these new requirements.

Agenda Item 9: Any other business

APANPIRG Deficiencies List

9.1 The meeting reviewed the List of Deficiencies in the ATM/AIS/SAR fields (**Appendix J** refers), as updated by APANPIRG/16 (August 2005) based on information provided to the Regional Office by States, noting that the routine presentation of the deficiencies list to ICAO meetings in general would serve to raise awareness of the list and the deficiency matters contained in the list. This was increasingly relevant in terms of the recent steps being taken by ICAO to raise effectiveness in the management of deficiencies and in terms of APANPIRG Conclusion 16/6 which required the inclusion on the deficiencies list of States that had not provided safety related data to approved regional safety monitoring agencies, including RMAs.

9.2 In noting the WGS-84 deficiencies recorded on the list, IFALPA drew attention to discussions at the 42nd Conference of Directors General of Civil Aviation. The Conference was informed that the Terminal Aeronautical GNSS Geodetic Survey (TAGGS) programme was a cooperative programme among the National Geospatial-Intelligence Agency (NGA), FAA, international aviation organizations and civil aviation agencies of many individual countries. The goal of the TAGGS programme was to produce a highly accurate WGS-84 database of airfield survey data, airfield features and vertical obstructions surrounding numerous airfields worldwide. In locations where survey, obstruction or aeronautical data had not been collected, or was inadequate, TAGGS geodetic experts could assist in developing a plan to acquire the data. Methods of assistance may include training, loans of surveying equipment or the provision of a team of surveyors to obtain data that meets ICAO standards.

Draft ICAO Safety Management Manual (SMM, Doc 9859)

9.3 Although safety management provisions had been introduced into Annex 11 some years ago, ICAO experienced some delays in publishing an appropriate Manual of Safety Management for ATS. A draft ATS Manual was eventually presented to the 11th Air Navigation Conference (22 September – 3 October 2003) and was circulated electronically as a final draft document.

9.4 Subsequently, in light of the expansion of provisions for safety management systems in other areas in addition to ATS, in particular Annex 14 – *Aerodromes* and Annex 6 – *Operation of Aircraft*, ICAO pursued the philosophy of a combined safety management manual, rather than a series of separate manuals addressing separate ICAO Annexes.

9.5 The meeting was advised that, with effect from mid October 2005, the draft *ICAO Safety Management Manual* (SMM, Doc 9859-AN/460), containing combined safety management provisions, had been placed on the internal ICAO web and was authorized for release to State civil aviation administrations as a final draft document, subject to a disclaimer noting that the document was still a

“work in progress”. A reproduction of the Table of Contents of the SMM has been included as **Appendix K** and electronic copies of the draft Manual would be available from the Regional Office on request.

9.6 In commending the intention of Japan to translate the SMM into Japanese for State usage, the Regional Office cautioned that at this stage the SMM was in draft form and it would be appropriate for Japan to await a final version of the document prior to commencing translation. The Regional Office undertook to establish from ICAO Headquarters when a final document that was suitable for translation was expected to become available, and would notify Japan accordingly.

Required Communication Performance (RCP) Concepts

9.7 To meet the demands on airspace capacity and operational efficiency, operational communication capability is increasingly playing an essential role in air traffic management using a mixture of data and voice communication. For example, data link can provide for integration of air traffic management functional capabilities on the aircraft and at the ATS units, direct controller-pilot communications enabling user-preferred and dynamic rerouting and intervention capabilities in reduced separation environments where alternative communications are more cumbersome.

9.8 The Required Communication Performance (RCP) concept provides a means to ensure the acceptable performance of communications within a complete ATM system and also assesses the need for objective operational criteria, in the form of an RCP type, encompassing operational communication transactions taking into account human interactions, procedures, and environmental characteristics.

9.9 The development of SARPs, procedures and guidance material relating to the use of RCP is being progressed under the auspices of the ICAO Operational Data Link Panel (OPLINK). Currently the OPLINK Panel is considering arrangements under which the RCP type is specified by the value for the communication transaction time (in seconds) associated with the ATM function e.g. RCP400. Each RCP type denotes values for the maximum time for the completion of the operational communication transaction, continuity, availability, and integrity applicable to the most stringent operational communication transaction supporting an ATM function.

9.10 The following are examples of RCP types under consideration:

- RCP 10 would be used for controller intervention capability supporting separation assurance in a 5 nm radius environment.
- RCP60 - In combination with the RCP 10 in a 5 nm radius environment, RCP 60 may be applied to routine communications on a data link system to offload the voice communication system.
- RCP 120 would be used for controller intervention capability supporting separation assurance in a 15 nm radius separation environment.
- RCP 240 would be used for controller intervention capability supporting separation assurance in a 30/30 separation environment.
- RCP 400 would be used for controller intervention capability supporting separation assurance in current environments where separations are greater than 30/30 and alternative technologies are planned for providing normal means of communication, e.g., Iridium voice or HF data link in lieu of HF voice.

9.11 The OPLINK Panel has finalized its work on the ICAO *Manual on Required Communication Performance* and has recommended that the Manual be published as a matter of urgency.

9.12 The meeting was alerted to the conceptual similarities between RNP and RCP, noting ICAO's philosophy of pursuing Required Total Systems Performance (RTSP) via RNP, RCP and Required Surveillance Performance (RSP) methodologies. The meeting recalled some of the difficulties that had been experienced with RNP and the divergences that currently exist that have necessitated the formation of an ICAO study group to clarify and realign what was intended by RNP. Concern was also expressed in respect of the apparently very prescriptive nature of RCP and the consequent lack of flexibility to operators and ATS providers in meeting the RCP type. The meeting agreed that these issues were best dealt with by the relevant expert ICAO Panel and would await further information in due course.

Agenda Item 10: Date and venue of RASMAG/5 meeting

10.1 In considering the date and venue of the next meeting, the meeting recognised that some delegates would be involved in both the Study Group on Funding Safety Monitoring that had been called for under APANPIRG Conclusion 16/2 and RASMAG/5. In this respect it was appropriate that the meetings be held back-to-back to facilitate attendance by delegates at both meetings. Accordingly, the meeting agreed that the RASMAG/5 meeting should be held over a four-day period from 5 – 8 June 2006, immediately following the 3-day meeting of the Study Group on Funding Safety Monitoring, which was scheduled from 31 May to 2 June 2006. Both the meetings would be held at the Regional Office premises in Bangkok, Thailand.

11. Closing of the meeting

11.1 The Chairperson, Ms. McCormick, thanked the representatives for their participation in the meeting and for the excellent work achieved. Improvements by several States in submitting data required for airspace safety monitoring were evident. This was due, for the most part, to the efforts of the MAAR, PARMO and the Regional Office. Ms. McCormick noted that this type of increased interest and attention to safety monitoring is a major step forward to developing and improving safety management programs.

11.2 Participants were urged review the guidance material documents that were presented during the meeting and to forward recommendations for changes to the authors.

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LIST OF WORKING AND INFORMATION PAPERS

WORKING PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
WP/1	1	Provisional Agenda	Secretariat
WP/2	2	Outcomes of APANPIRG/16 in relation to RASMAG	Secretariat
WP/3	3	Review of RASMAG/3 ATS Safety Management Seminar	Secretariat
WP/4	5	Outcomes of South East Asia – ATS Safety Management SIP	Secretariat
WP/5	3	Draft of a Handbook To Guide Monitoring In The International Airspace of the Asia/Pacific Region in connection with Introduction and Continued Safe Use of an Horizontal-Plane Separation Minimum where Required Navigation Performance (RNP) Is Applied	Australia United States
WP/6	6	Review of RASMAG Task List	Secretariat
WP/7	7	Outcomes of Special ATS Coordination Meeting for RVSM Task Force – Review of Western Pacific/South China Sea (WPAC/SCS) Flight Level Orientation Scheme (FLOS)	Secretariat
WP/8	3	Guidance Material – Data Link Ground Equipment	Japan New Zealand
WP/9	7	Summary of the Report of the First Middle East Regional Monitoring Agency Board	Secretariat
WP/10	4	Progress Report on Safety Monitoring Agency (SMA) Establishment for Asia Region	Thailand
WP/11	5	Summary of the Airspace Safety Review for the RVSM Implementation in Asia Region	Thailand
WP/12	7	List of Air Navigation Deficiencies in the ATM/AIS/AR fields	Secretariat

INFORMATION PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
IP/1	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP/2	5	Acceptable Level of Safety within the Airspace of Hong Kong, China	Hong Kong, China
IP/3	7	Draft Document 9859 – ICAO Safety Management Manual	Secretariat
IP/4	7	Required Communication Performance (RCP) Concepts – An Introduction	Secretariat
IP/5	5	RVSM Pre-Implementation and Transition in Japan	Japan
IP/6	2	Outcomes of the 42 nd DGCA Conference in relation to RASMAG	Secretariat

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RASMAG ATS Safety Management Seminar

8 – 10 June 2005, Bangkok, Thailand

Programme Details

Wednesday, 8th June 2005

Session 1:

- a) ICAO ATS Safety Management Provisions
Mr. Andrew Tiede, ICAO Regional Officer, ATM
- b) The Need for and Fundamentals of Safety Management Systems
Mr. Robert Butcher, Airservices Australia
- c) The Need for Safety Assessments and Safety Monitoring in Reduced Vertical and Horizontal Separation Implementation
Mr. Brian Colamosca, US Federal Aviation Administration

Session 2:

- a) The Role of the Airlines in risk assessment activities and their contribution to safety analyses undertaken by States
Mr. Neil Jonasson, IATA Asia/Pacific Office
- b) Implementation of ICAO Safety Management Requirements – The Monitoring of Safety Levels in Hong Kong ATC Operations
Mr. Fan Wai Chuen Lucius, Civil Aviation Department, Hong Kong, China
- c) Central Reporting Agency for the FANS Implementation Team for South-East Asia (FIT-SEA CRA)
Mr. Yoshiro Nakatsuji, Air Traffic Control Association, Japan

Thursday, 9th June 2005

Session 3:

- a) RVSM – Safety Considerations in Planning and Implementation
Mr. Sydney Maniam, RVSM/TF Chairman, Civil Aviation Authority of Singapore
- b) MAAR's Activities with regard to RVSM Safety Assessments, Traffic Sampling, State Reporting Formats, Analyses and Reporting
Dr. Paisit Herabat, Monitoring Agency for the Asia Region (MAAR), AEROTHAI
- c) How Safety Assessments and Monitoring are conducted – The Essential Elements & What States need to provide to MAAR
Dr. Paisit Herabat, Monitoring Agency for the Asia Region (MAAR), AEROTHAI

- d) Outline of Recommended Guidelines for ADS/CPDLC Deployment
Mr. Hiroshi Matsuda, Air Traffic Control Association, Japan
- e) Incident Reporting and Data Collection
Mr. Robert Butcher, Airservices Australia

Session 4:

- a) Description of the Roles, Responsibilities and Functions of Airspace Safety Organizations – RASMAG, RMAs, SMAs, CRAs, FITs etc.
Mr. Andrew Tiede, ICAO Regional Officer ATM
- b) Collision Risk Modelling, Technical Risk, Risk from Operational Errors, Target Level of Safety – An Explanation in Simple Terms
Mr. Brian Colamosca, US Federal Aviation Administration
- c) Safety Assessment and Monitoring in Japan's domestic RVSM Implementation
Mr. Takashi Imuta, Civil Aviation Bureau, Japan

Friday, 10th June 2005

Session 5:

- a) Finance Arrangements – Mechanisms to facilitate collaborative funding of safety monitoring agencies
Dr. Paul Hooper, ICAO Regional Officer, Air Transport
- b) Risk Analysis
Mr. Toby Farmer, Civil Aviation Authority of New Zealand
- c) Hazard Identification Methodologies and Hazard Mitigation Strategies
Mr. Robert Butcher, Airservices Australia
- d) ICAO Regional Airspace Planning, Implementation and Safety Arrangements
Mr. Andrew Tiede, ICAO Regional Officer ATM

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PROPOSED ACTION PLAN FOR SMA ESTABLISHMENT (ESTIMATED DATES)

Item	Work Description	2005			2006										2007							
		O c t	N o v	D e c	J a n	F e b	M a r	A p r	M a y	J u n	J u l	A u g	S e p	O c t	N o v	D e c	J a n	F e b	M a r	A p r	M a y	J u n
1	Consult with FAA Technical Center for SMA establishment												If a p p r o v a l is g r a n t e d .									
2	Modify FAA-AEROTHAI agreement																					
3	Arrange funding requirements																					
4	SMA Training 1																					
5	Review collision risk model and risk estimation methodology																					
6	Setup SMA system																					
7	Provide the progress report of SMA establishment to RASMAG for acknowledgement and endorsement																					
8	Propose the progress report of SMA establishment in ATM/AIRSAR Subgroup for endorsement																					
9	Propose the action plan of SMA establishment to the APANPIRG for official approval																					
10	Assume SMA duties and responsibilities											→			←							
11	Request required data for the preliminary safety assessment																					
12	Conduct preliminary safety assessment																					
13	SMA Training 2																					
14	Report the first airspace safety review in RASMAG																					

SAFETY MONITORING AGENCY TRAINING

PROPOSED AGENDA

Agenda Item 1: Safety Monitoring Agency (SMA): Overview

- Basis for SMA Establishment
- SMA Duties and Responsibilities

Agenda Item 2: SMA Requirements

- Required Data
- Required Forms and Templates
- Database Structure
- Data Sharing

Agenda Item 3: Safety Assessment Procedures

- Overview of collision risk methodology
 - o Assumptions underlying the model
 - o Development of the basic model
- Collision risk methodology
- RNP safety goal: the Target Level of Safety (TLS)
- Know Your Airspace Analysis for Lateral & Longitudinal Safety Assessment
- Lateral & Longitudinal deviations
 - o Categories and causes
 - o Reporting mechanism of the deviation occurrences within a Region

Agenda Item 4: Estimation of CRM Parameters

- Overview of CRM Parameters
- Estimation Methodology
- Associated Data Requirements

Agenda Item 5: Review of Draft SMA Handbook (if available)

Agenda Item 6: Any Other Business

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Federal Aviation
Administration



Implementing 30-NM Lateral and Longitudinal Separation Standards in ZOA OC3: Preliminary Safety Assessment

Regional Airspace Safety
Monitoring Advisory Group

RASMAG/4

26 October 2005

Overview

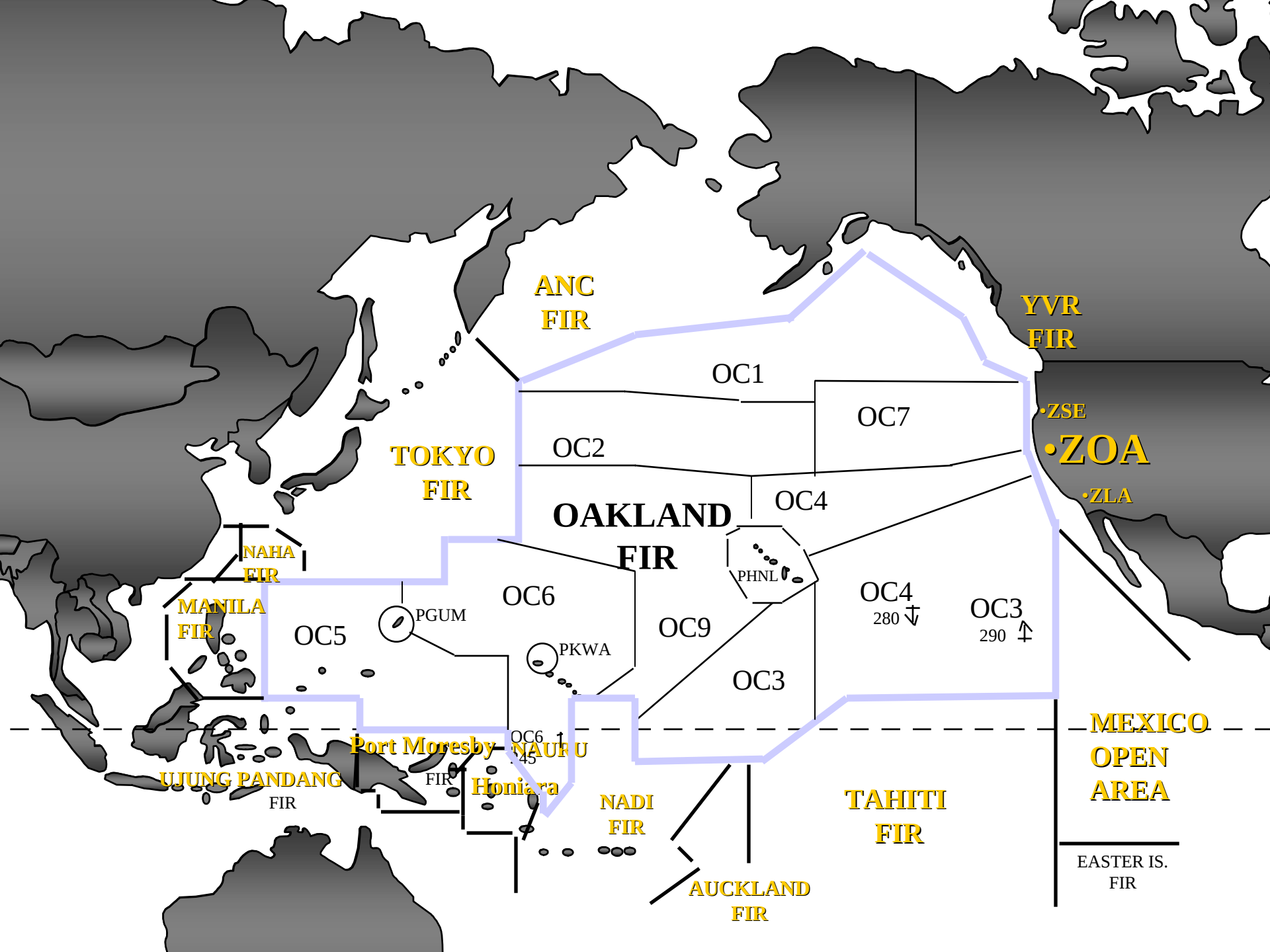
- (1) Review of Target “30-30” Airspace
- (2) Approval Status of OC3 Operators
- (3) Overall Safety Assessment Approach
- (4) Overview of Enhanced Traffic Management System Data
- (5) Overview of Radar Data
- (6) Summary of Ocean21 data
- (7) Know Your Airspace
- (8) Preliminary risk estimates





**Federal Aviation
Administration**

Review of Target “30-30” Airspace



Review of Target “30-30” Airspace

- 30-nm longitudinal and lateral separation standards will be implemented in Oakland Oceanic Control Sector 3 (ZOA OC3)
- Predominant traffic flows:
 - U.S. West Coast and South Pacific States
 - Southern 3 routes of Central East Pacific (Hawaii/West Coast of North America) track system
- Target date for implementation: 22 December 2005
- Implementation will be an operational trial



Review of Target “30-30” Airspace - Continued

- **“Operational trial” means that 30-30 separation will be applied to suitably approved pairs of aircraft within the target airspace after successful outcome of pre-trial safety assessment in order to:**
 - **Gain practical experience with use of the new standards**
 - **Gather sufficient empirical evidence to confirm positive indications of safety assessment**
 - **Monitor operations until FAA regulatory authorities are convinced that new separation minima may be extended safely to other portions of Oakland FIR**





**Federal Aviation
Administration**

Approval Status of OC3 Operators

Approval Status of OC3 Operators

- **FAA Technical Center provides Pacific Approvals Registry and Monitoring Organization (PARMO) as regional monitoring agency for Pacific RVSM**
 - **Among other things, PARMO maintains a database of RVSM and RNP-10 approvals, including appropriate State regulatory authority contacts**
 - **PARMO has requested relevant State authorities to determine “30-30 approval status ” (RNP-4 approval without time limit and FANS-1/A package) of operators/aircraft in OC3**



Approval Status - Continued

- **Results**

- **UAL approved: 35 B747-400 aircraft, per FAA**
- **ANZ approved: 8 B747-400 aircraft, per CAA of New Zealand**
- **QFA not approved, per Civil Aviation Safety Authority of Australia**
 - **Requires parliamentary legislation**
 - **Working toward publication of “30-30” Advisory Circular in mid-December**
 - **All QFA OC3 aircraft to be approved are B747-400**
 - **OC3 safety assessment done assuming QFA aircraft will be approved near to start of operational trial**



Approval Status - Continued

- **Results**
 - **THT not approved – French DGAC seeking FAA guidance to establish approval process; Air Caledonie will be first candidate**
 - **FJI – Fiji CAA reports that Air Pacific has not made application for RNP-4 approval for FANS B744**
 - **ACA – in contact with Transport Canada but no final indication of date for establishment of approval process; ACA has not provided any information regarding approval intent**



Approval Status - Concluded

- **Consequence of OC3 traffic characteristics and anticipated “30-30 approved” aircraft:**
 - **30-nm lateral and longitudinal separation standards will be applied only to traffic between KLAX/KSFO and NZAA/NZCH---YSSY/YMML/YBBN**





**Federal Aviation
Administration**

Overall Safety Assessment Approach

Overall Safety Assessment Approach

- Use ICAO-endorsed collision risk methodology to demonstrate that risk upon introduction 30-nm lateral and longitudinal separation minima will satisfy Target Level of Safety (TLS) of 5×10^{-9} fatal accidents per flight hour due, separately, to the loss of 30-nm lateral and 30-nm longitudinal separation, following prescriptions of Annex 11
- Application of 30-30 separation standards marks first inclusion of tactical air traffic control, or controller decision support system, in estimation of risk associated with enroute separation minima



Overall Safety Assessment Approach - Continued

- In OC3 operational trial, controller decision support system is FAA's automated oceanic air traffic control system, Ocean21
- Ocean21 fully compliant with provisions of Annex 11 and Doc 4444 regarding automatic dependent surveillance (ADS) and controller-pilot data link communications (CPDLC) support of 30-30 separation standards, such as:
 - Making ADS contracts with 14-minute update rate for suitably approved aircraft
 - Lateral deviation event contract set to 5 nm
 - Reversion to procedural separation if ADS message is overdue by 3 minutes and 8 minutes have elapsed since controller began attempting to establish communication



Overall Safety Assessment Approach - Continued

- **Consider risk due to loss of lateral separation and longitudinal separation separately**
- **Estimate risk for loss of each separation standard as if airspace were managed in strictly strategic manner, without decision support aids of Ocean21**
- **If lateral and longitudinal risks each satisfy TLS, then 30-nm lateral and longitudinal separation standards are “safe”**

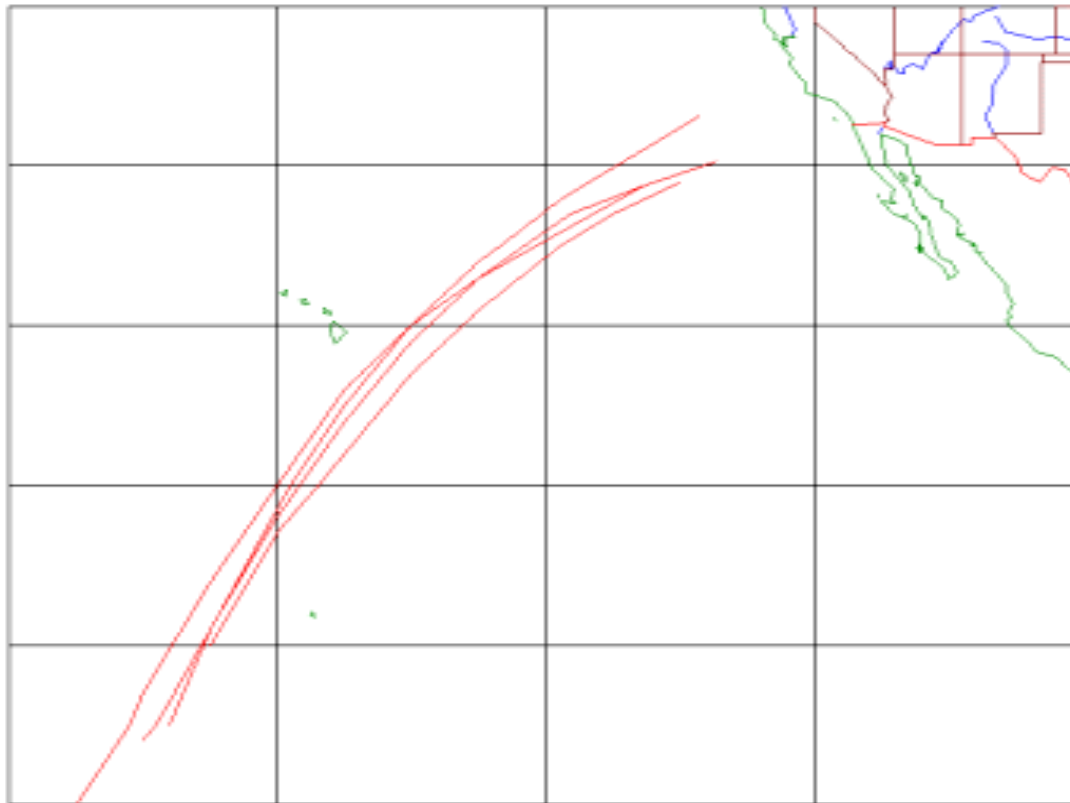


Overall Safety Assessment Approach - Continued

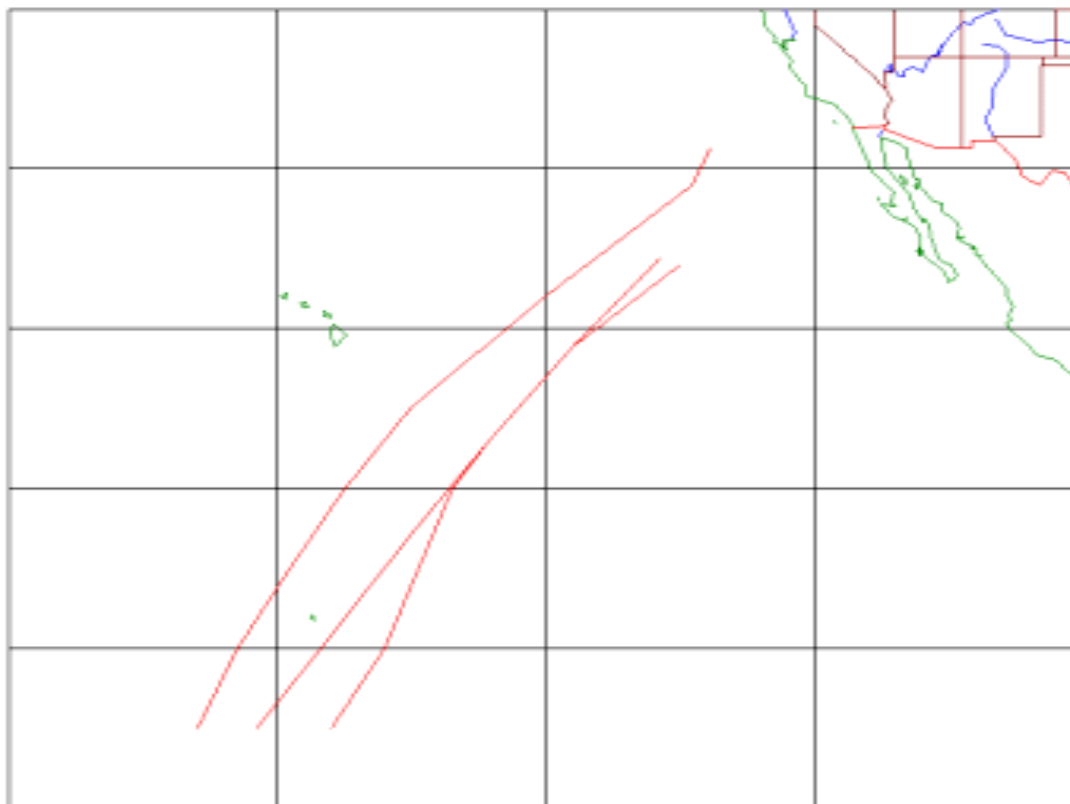
- **Problem One: Operators in OC3 file User Preferred Routes (UPRs) developed in light of forecast meteorology, resulting, typically, in operations on other than published ATS routes in sector (see following figures of OC3 UPRs)**
 - **This makes collision risk model developed to estimate lateral risk for parallel-route operations difficult to apply**
- **Problem Two: UPRs often result in operations on routings which are not the same for any two flights on same day**
 - **This makes collision risk model developed to estimate longitudinal risk for pairs of co-altitude aircraft on same route difficult to apply**



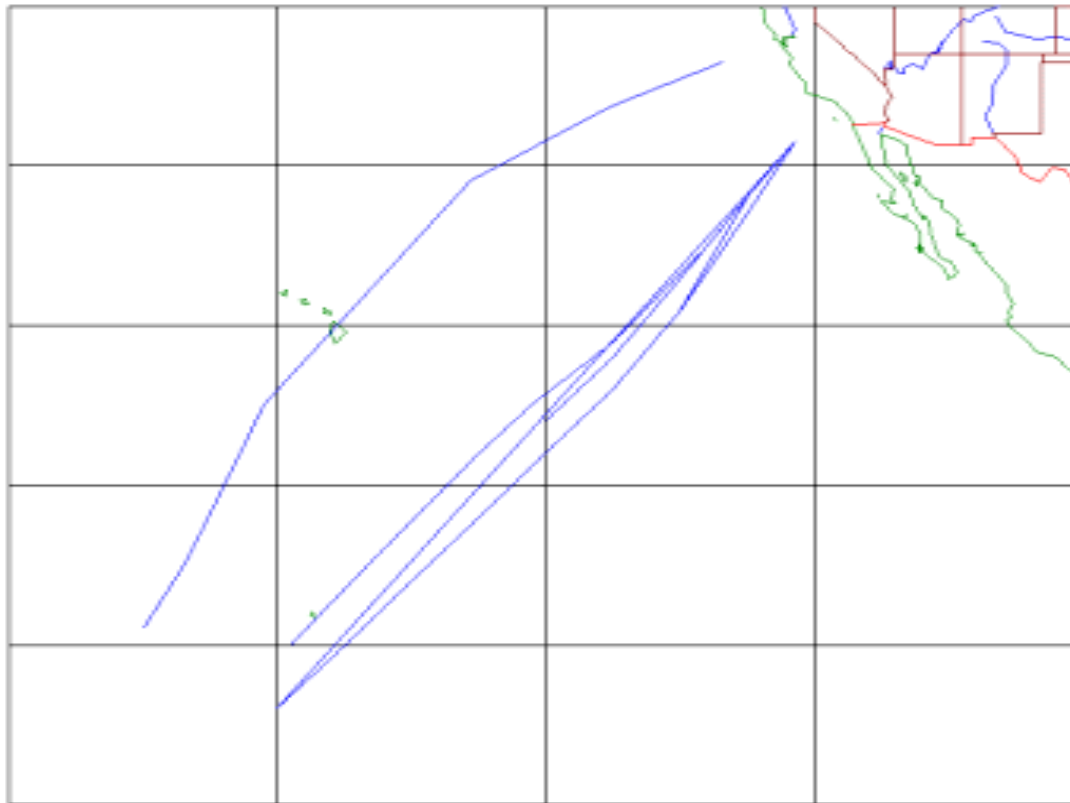
Flight Plans For One Day: YSSY/YMML/YBBN — KSFO/KLAX



Flight Plans For One Day: NZAA — KSFO/KLAX



Flight Plans For One Day: KSFO/KLAX – YSSY/YMML/YBBN



Overall Safety Assessment Approach - Continued

- **Have chosen parameters for lateral and longitudinal risk models which:**
 - **Are established values from Pacific or North Atlantic, where appropriate**
 - **Reflect B744 aircraft size**
 - **Result from processing flight-plan, controller-pilot data link communication and radar data from September 2004 through August 2005, plus all available Ocean21 data from Oakland FIR – with special emphasis on OC3 operations**



Overall Safety Assessment Approach – Lateral Risk: I

- Requirement to show lateral risk satisfies TLS (and, therefore, operational trial may go forward)
 - Annex 11, Attachment B, Table B-1 (page ATT B-5) provides relationship between maximum proportion of 15-nm or greater lateral errors associated with meeting TLS and lateral occupancy (or relative packing of traffic on parallel routes separated laterally by 30 nm) for pair of routes with traffic on each route operating in same direction, four-route set of same-direction flows, seven-route set and pair of parallel routes with flows on two routes in opposite directions



Overall Safety Assessment Approach – Lateral Risk: II

- Analysis of traffic flows (to be described) indicates lateral risk for flows in OC3 can be bounded from above by assuming all operations are at same altitude on pair of parallel routes
 - Have modified assumptions underlying Table B-1 to produce more stringent large-error frequency for pair of parallel, same-direction routes.
 - Need to meet requirement that frequency of 15-nm or greater lateral deviations does not exceed the range 0.5 to 1.0×10^{-4}



Overall Safety Assessment Approach –Lateral Risk: III

- **Problem: RNP-4 approval process only recently available**
 - Have roughly 2 000 radar-based observations of lateral errors for OC3 aircraft, all of which are less than 15 nm in magnitude
 - Need on the order of 10 000 observations of OC3 lateral errors in order to conclude with high confidence that requirement for frequency of lateral deviations is met
 - **Solution: Do sequential sampling of OC3 lateral errors during operational trial in order to establish satisfaction of requirement with high confidence**



Overall Safety Assessment Approach – Longitudinal

- Analysis of traffic flows (to be described) indicates longitudinal risk for flows in OC3 can be bounded from above by assuming all operations are on a single route at a single flight level
 - Have identified (conservative) initial distribution of aircraft-pair along-track separations from OC3 traffic data
 - Have determined distribution of conservative gain/loss in longitudinal separation for operations within airspace
 - “Conservative” implies that have chosen values producing produce higher risk estimate than other plausible distributions derived from the same data





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Overview of Enhanced Traffic Management System Data

Enhanced Traffic Management System Data

- **FAA Technical Center collects Pacific Enhanced Traffic Management System (ETMS) data daily as part of PARMO activities**
 - **Have several years of data**
- **Technical Center is using ETMS data from the period September 2004 through August 2005 for the safety assessment**
- **Estimate of annual number of flying hours of RNP-4 approved FANS aircraft (ANZ, QFA, UAL) based on January – August 2005 ETMS sample: 50,000**



Enhanced Traffic Management System Data

- **ETMS data contain several message types which are important to safety assessment**
 - **Departure messages containing actual departure times from KLAX/KSFO**
 - **Boundary crossing messages containing actual locations and times for flights crossing significant airspace boundaries (for example, domestic to oceanic control areas)**
 - **Flight plan messages containing details of flight plans**
 - **Arrival messages containing actual arrival times at U.S. destination airports**





**Federal Aviation
Administration**

Overview of Radar Data

Overview of Radar Data

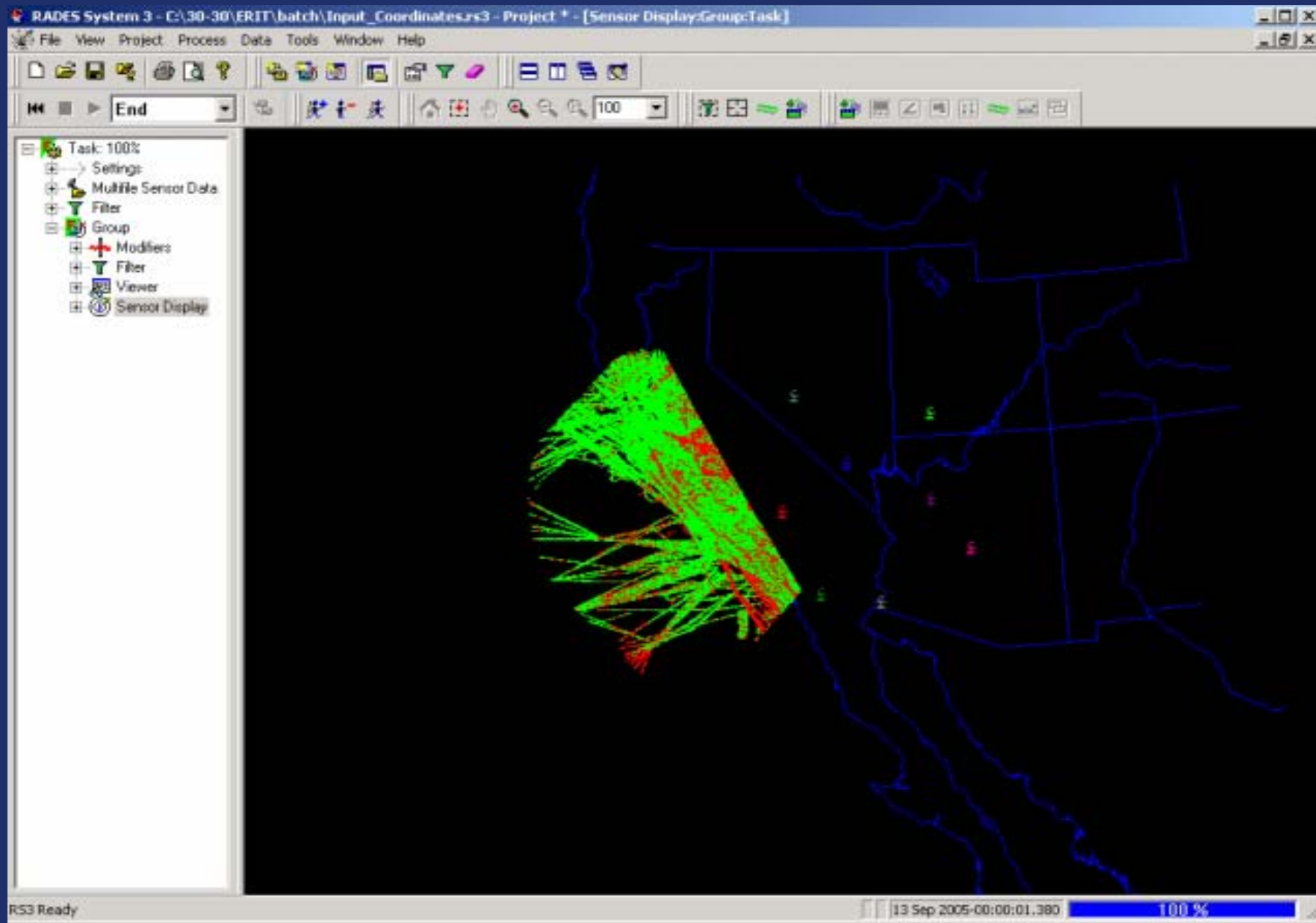
- **Technical Center collects NAS enroute radar data from Los Angeles Air Route Traffic Control Center (ZLA)**
- **Several ZLA radars cover OC3 oceanic gateways (see plot)**
- **Radar data being used to compute lateral deviation from course of RNP-4/FANS aircraft at first radar contact**
 - **2 000 observations with no lateral deviation exceeding 5 nm**

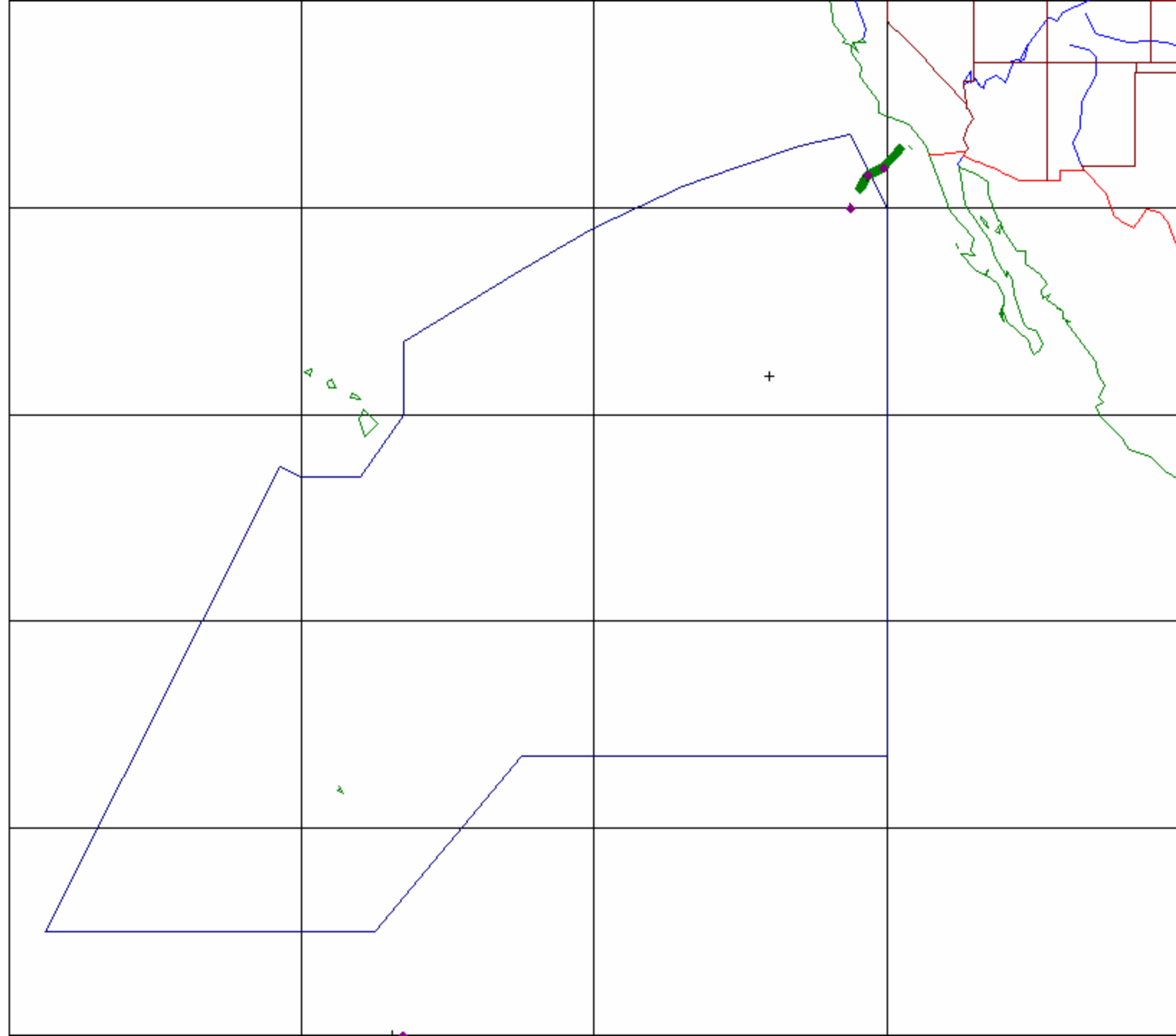


Overview of Radar Data - Continued

- Radar data also being used to compute differences between aircraft's radar position and Automatic Dependent Surveillance (ADS) position
 - Mean = 0 nm, standard deviation = 0.25 nm



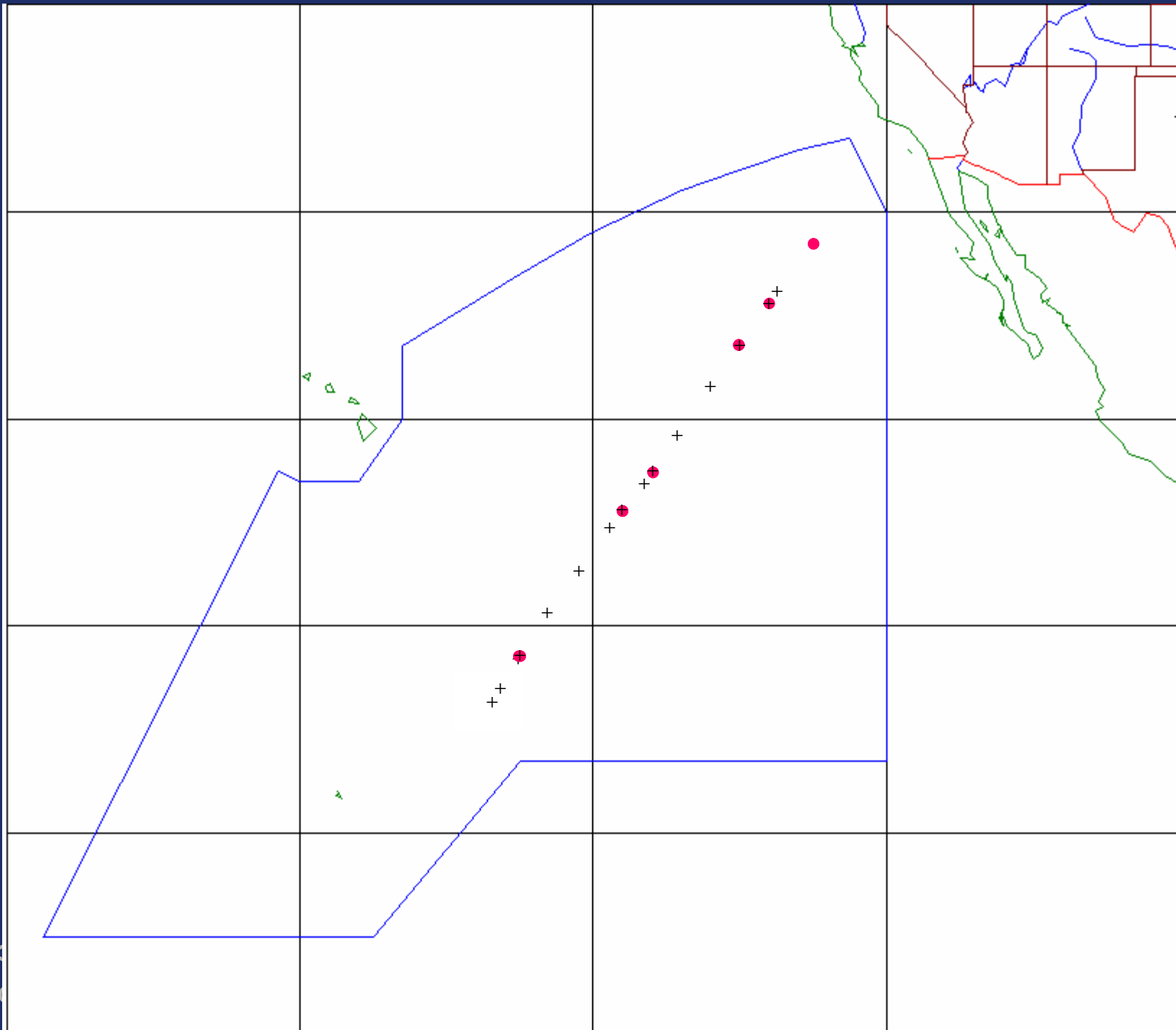






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Summary of Ocean21 data



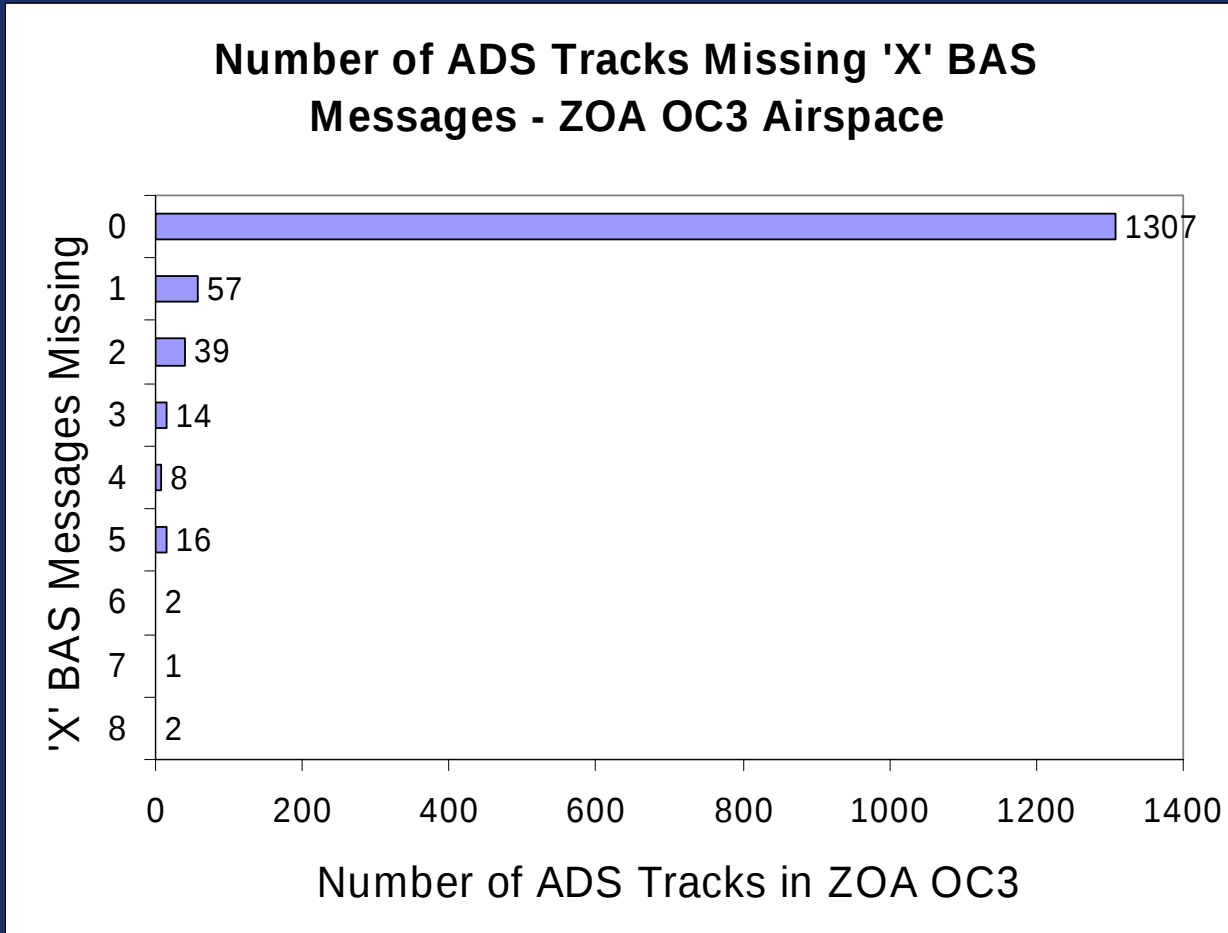
ATOP Track

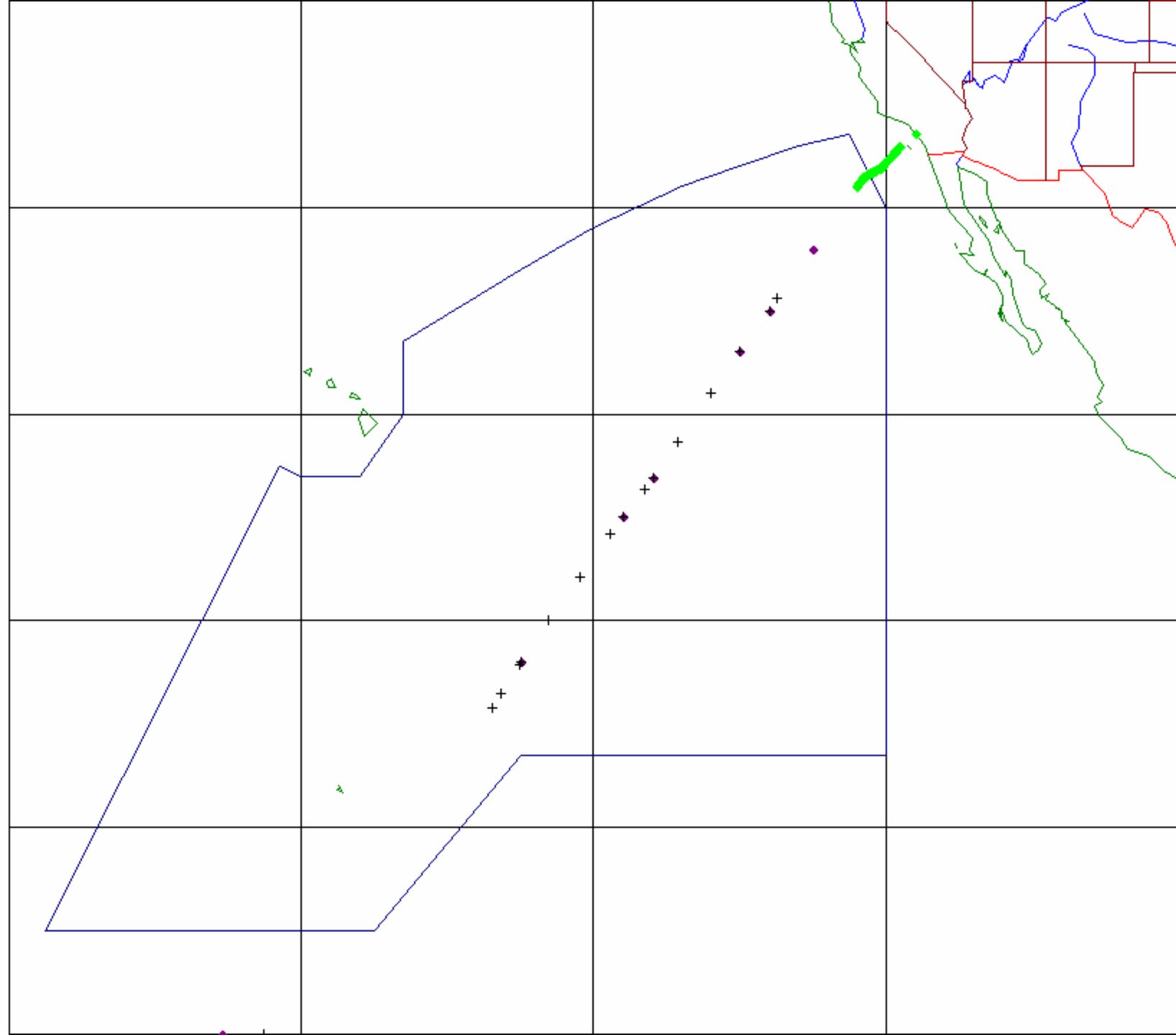
DATE Jun 8 2005 ACID UAL863 REGNO N104UA
 AVERAGE INTER ARRIVAL TIME = 9.0889 MINS
 INTER ARRIVAL TIME SD = 9.7592 MINS
 MAXIMUM INTER ARRIVAL TIME = 24.9500
 MESSAGE DURATION (MINS) = 136.3333
 DLink Msg Start = 11:30:30
 DLink Msg Stop = 13:46:50

MSG TYPE	MSG TIME	INT-ARR TIM(min)	CURRENT POSITION	NEXT POSITION AND TIME
BAS	11:30:30	0.0000	(11.156, -159.526) 33000 ft	(8.500, -161.500) 33000 ft 11:54:38
BAS	11:33:28	2.9667	(10.831, -159.770) 33000 ft	(8.500, -161.500) 33000 ft 11:54:36
WPC	11:54:46	21.3000	(8.498, -161.502) 33000 ft	(5.000, -164.000) 33000 ft 12:26:18
BAS	12:00:08	5.3667	(7.903, -161.930) 33000 ft	(5.000, -164.000) 33000 ft 12:26:12
WPC	12:23:27	23.3167	(5.560, -164.077) 34000 ft	(5.259, -164.329) 34000 ft 12:27:31
WPC	12:26:22	2.9167	(5.284, -164.367) 34000 ft	(-1.715, -170.305) 34000 ft 13:33:58
BAS	12:26:47	0.4167	(5.245, -164.408) 34000 ft	(-1.715, -170.305) 34000 ft 13:33:51
WPC	12:27:27	0.6667	(5.183, -164.471) 33992 ft	(-2.000, -170.000) 99999 ft 99:99:09
BAS	12:52:24	24.9500	(2.483, -166.450) 33996 ft	(-2.000, -170.000) 99999 ft 99:99:09
BAS	12:53:28	1.0667	(2.358, -166.525) 34000 ft	(-2.000, -170.000) 34000 ft 13:34:48
LDC	12:55:39	2.1833	(2.114, -166.691) 34000 ft	
BAS	12:56:09	0.5000	(2.058, -166.729) 34000 ft	(-2.000, -170.000) 34000 ft 13:34:49
BAS	13:20:09	24.0000	(-0.520, -168.734) 34000 ft	(-2.000, -170.000) 34000 ft 13:34:29
WPC	13:34:28	14.3167	(-2.003, -170.004) 34996 ft	(-5.000, -173.000) 35000 ft 14:05:08
BAS	13:45:15	10.7833	(-3.060, -171.057) 34996 ft	(-5.000, -173.000) 35000 ft 14:05:11
BAS	13:46:50	1.5833	(-3.215, -171.212) 35000 ft	(-5.000, -173.000) 35000 ft 14:05:14



Information On Missing Basic ADS Position Reports







**Federal Aviation
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Know Your Airspace

Characterization Of Airspace Based on Data Sources: IOAG

- **International Official Airline Guide Schedule of Operations**

Australasian Summer schedule (January 9-15): 16 to 22 flights/day

Australasian Winter schedule (July 10-16): 16 to 22 flights/day



Characterization Of Airspace Based on Data Sources: IOAG For Sunday 9 January 2005 – KLAX To Australasia

- YYMMDD
- 050109 Sunday KLAX 345 NZAA 1630 B744 ANZ1
- 050109 Sunday KLAX 430 NZAA 1700 B744 QFA26
- 050109 Sunday KLAX 545 NZAA 1830 B744 ANZ5
- 050109 Sunday KLAX 630 YSSY 2100 B744 QFA12
- 050109 Sunday KLAX 630 YSSY 2100 B744 UAL839
- 050109 Sunday KLAX 715 YMML 2225 B744 QFA94
- 050109 Sunday KLAX 745 YSSY 2215 B744 QFA108
- 050109 Sunday KLAX 755 YBBN 2155 B744 QFA176
- 050109 Sunday KLAX 2050 YSSY 1120 B744 QFA8



Characterization Of Airspace Based on Data Sources: IOAG For Sunday 10 July 2005 – KLAX To Australasia

- YYMMDD
- 050710 Sunday KLAX 430 NZAA 1715 B744 ANZ1
- 050710 Sunday KLAX 440 NZAA 1710 B744 QFA26
- 050710 Sunday KLAX 530 YSSY 2005 B744 QFA12
- 050710 Sunday KLAX 550 YSSY 2025 B744 UAL839
- 050710 Sunday KLAX 620 YBBN 2005 B744 QFA176
- 050710 Sunday KLAX 630 NZAA 1915 B744 ANZ5
- 050710 Sunday KLAX 640 YMML 2155 B744 QFA94
- 050710 Sunday KLAX 650 YSSY 2125 B744 QFA108
- 050710 Sunday KLAX 2000 YSSY 1035 B744 QFA8



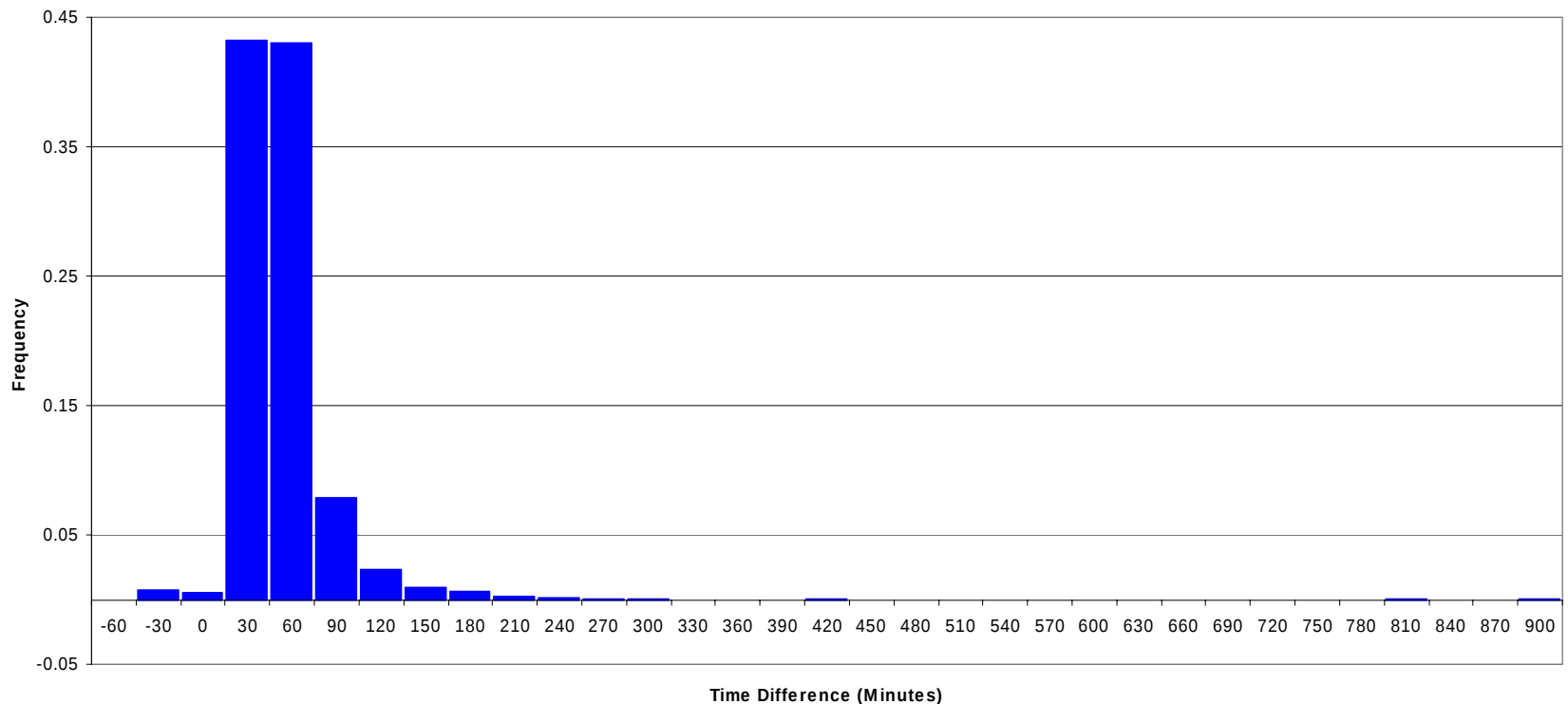
Characterization Of Airspace Based on Data Sources: ETMS and IAOG Data

- ETMS departure messages (DZ) indicate actual time of departure from KSFO/KLAX
- Examine difference between DZ time and IOAG scheduled departure times for 12 months
- Results - see figures



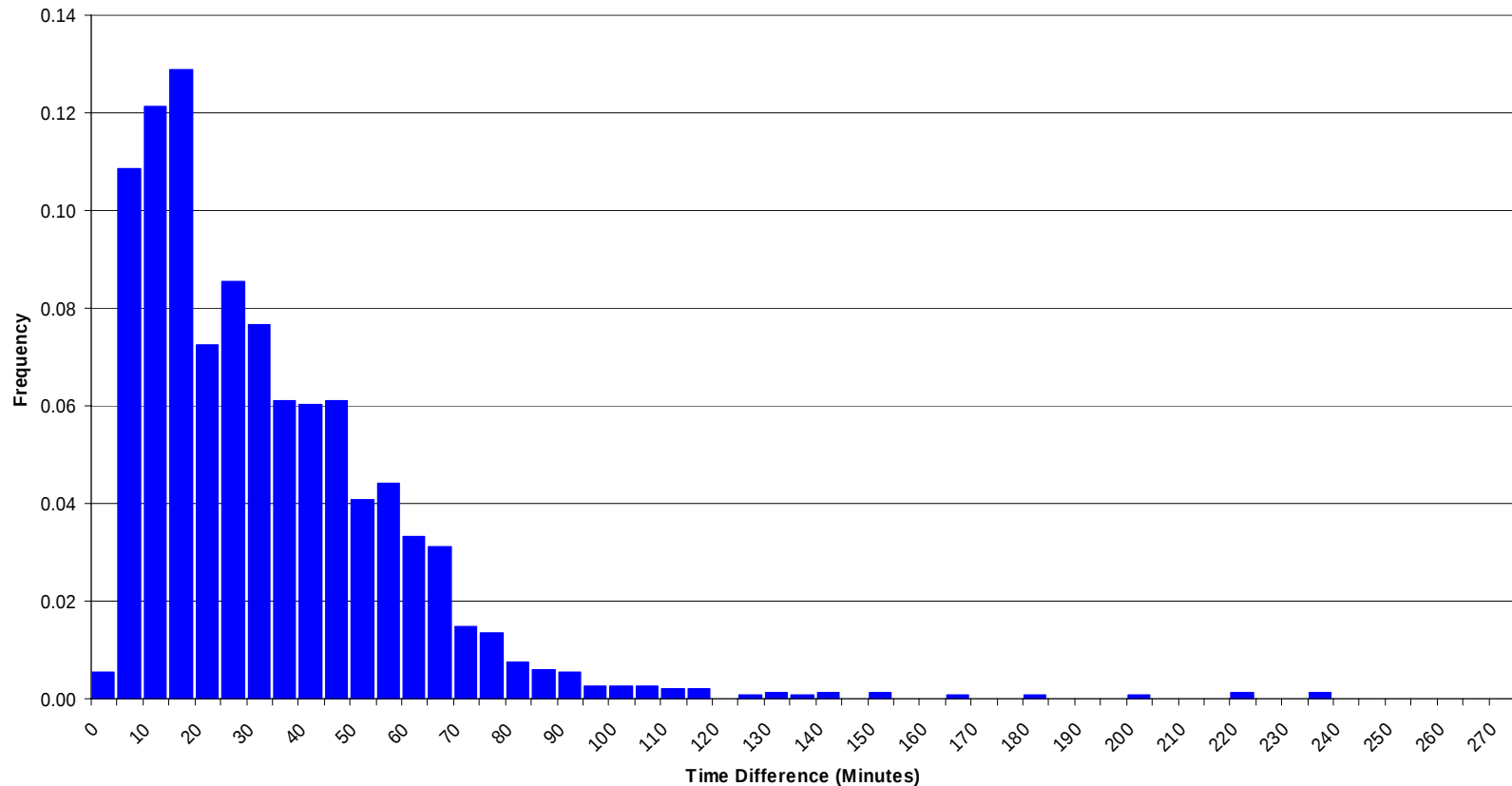
Difference Between Departure and Scheduled Times

Frequency Distribution of Time Difference Between
DZ Message and OAG Scheduled Departure



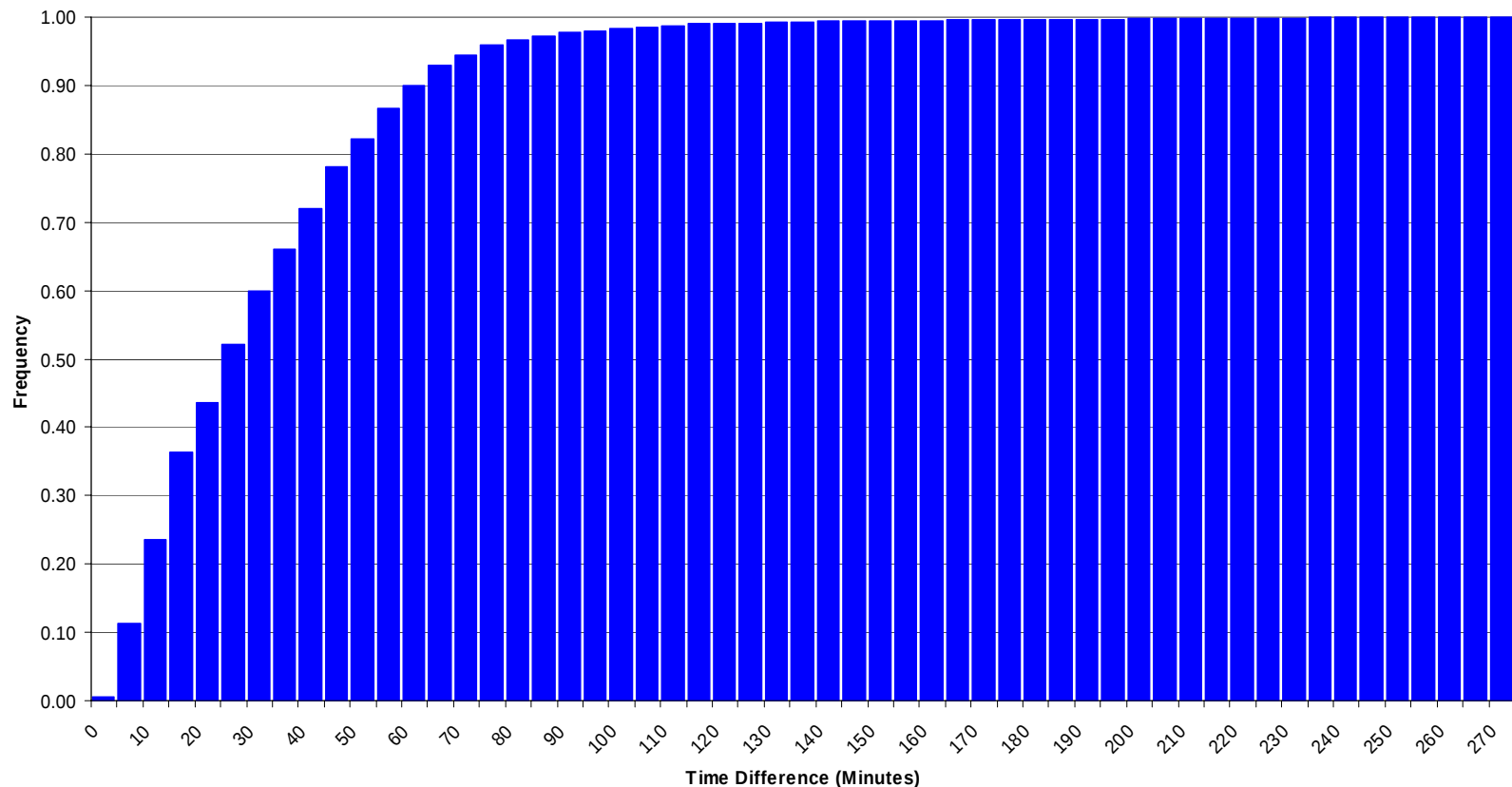
Difference In Arrival Times Over Oceanic Boundary For Southbound OC3 Flights

Frequency of Time Difference at OC3 Boundary for Southbound Flights



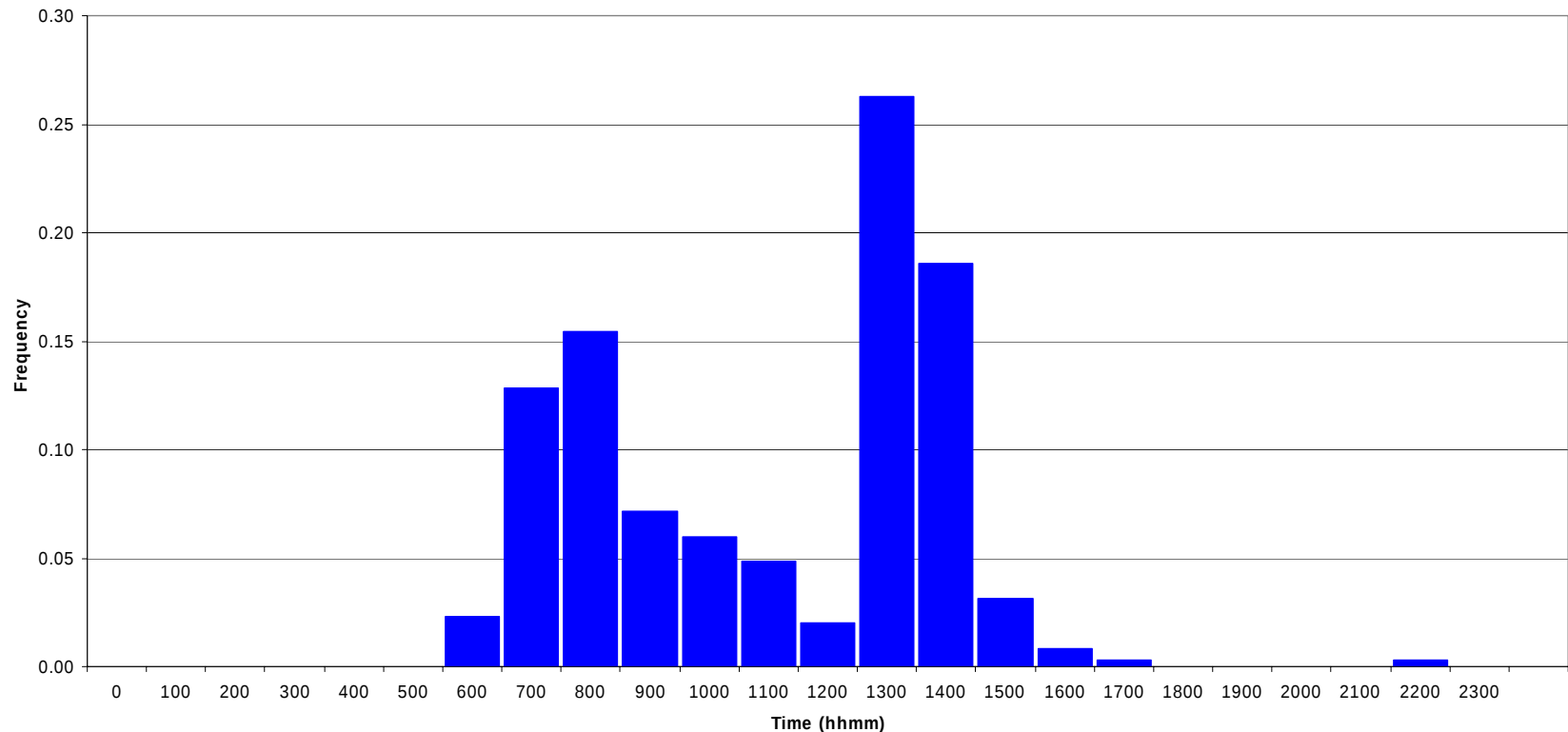
Cumulative Frequency Of Differences In Arrival Times Over Oceanic Boundary For Southbound OC3 Flights

Cumulative Frequency of Time Difference at OC3 Boundary for Southbound Flights



Example of Individual-Aircraft Arrival Times of Northbound Flights At Southern OC3 Boundary

Frequency of Time at Fix WOOPY





**Federal Aviation
Administration**

Preliminary Risk Estimates

Preliminary Risk Estimates

- UPRs make application of standard risk models difficult
- OC3 demand-for-service profiles and flight plans suggest that lateral risk can be bounded by assuming pair of parallel routes with lateral occupancy of 0.5 to 0.7 (required proportion of 15-nm or greater lateral errors in range of 0.5 to 1.0×10^{-4})
 - Due to recent publication of RNP-4 approval process, cannot demonstrate that this requirement is met before start of operational trial
 - In support of start of operational trial, experience shows that GPS-based lateral navigational performance in oceanic airspace demonstrably capable of meeting requirement



Preliminary Risk Estimates

- OC3 demand-for-service profiles and flight plans suggest that longitudinal risk can be bounded by assuming that all operations are conducted at same altitude on a single route
 - Distribution of initial longitudinal separation is rectangular between 30-nm and 40-nm with total density of 0.4 between these bounds
 - Loss or gain in separation is less than 2 minutes in magnitude with probability 0.95
 - Controller intervention to maintain separation required only in rare instances



Summary

- **Expect to complete safety assessment risk calculations in next week to 10 days, with outcome expected to show satisfaction of TLS in lateral and longitudinal dimensions**
- **Anticipate FAA Flight Standards review of safety assessment within two weeks, with decision to follow shortly thereafter**
- **Technical Center planning to support operational trial includes extensive data collection and analysis, in manner of monitoring agency, in order to support decision to transition from operational trial to fully operational use of 30-30 separation**
- **Expect to keep RASMAG informed of activities as means of assisting Group to integrate 30-30 safety monitoring oversight into its work program**



RASMAG/4
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RASMAG/4 — TASK LIST

(last updated 28 October, 2005)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
1/1	Review the Terms of Reference for RASMAG	RASMAG/3	Secretariat, all members	Open Completed	APANPIRG/15 agreed amendment to TOR After review, RASMAG/3 removed consideration of TOR as a standing Agenda item.
1/2	Coordinate with IPACG/ISPACG to formalise reporting from Pacific CRAs/FITs direct to RASMAG.	RASMAG/3	Secretariat, IPACG/ISPACG Co-Chair (L. McCormick, USA)	Open Completed	Some reports received by RO, RASMAG/2 WP/3 refers.
1/3	Review draft guidance material for End-to-End datalink systems performance monitoring.	RASMAG/3	New Zealand (T. Farmer); All members; Secretariat	Open Completed	Preliminary update reviewed by RASMAG/2 — RASMAG/2 WP/12 refers.. RASMAG/3 WP/11 — agreed to present draft material to ATM/AIS/SAR/SG and APANPIRG with recommendation that material be adopted as regional guidance material
1/4	Facilitate the required RVSM reporting to RASMAG from Australian RMA.	RASMAG/3	Australia (R. Butcher)	Open Completed	APANPIRG/15 designated Australia as RMA & SMA for relevant airspaces — RASMAG/2 WP/8 refers.
1/5	Coordinate by letter to ALL RMAs, CRAs and FITs requesting safety assessment and monitoring reports as per RASMAG/1 report, para 9.11. Draft to be circulated to members of RASMAG prior to despatch.	1/6/04	Secretariat	Open Completed	ISPACG and IPACG providing reports to RO, includes FIT & CRAs. FIT BOB and FIT SEA are ICAO meetings
1/6	Coordinate by letter to ALL States in Asia/Pacific in accordance with RASMAG/1 report, para 8.5 reminding them of their responsibilities with regards to safety assessments, monitoring and follow-up as per the reference. Draft to be circulated to members of RASMAG prior to despatch.	1/6/04	Secretariat	Open Completed	Letter dated 28 January 2004 circulated to BOB States (ref T3/10.1.7 — AP006/04ATM)

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
1/7	Monitor outcome of FLOS discussions at next RVSM TF meeting and report back to RASMAG.	1/10/04 RASMAG/3 45	Secretariat	Open	RASMAG/2 updated regarding outcomes of RVSM/TF/22 – RASMAG/2 WP/7 refers. Further update to RASMAG/3 required. RASMAG/3 WP/3 refers. RASMAG/3 raised draft Conclusions for consideration by APANPIRG in respect of non-provisions of safety data by States RASMAG/4 WP/7 refers, RVSM TF/28 scheduled April 2006
1/8	Develop generic reporting template and instructions for use by RMAs and other bodies to report RVSM, RNP and Data link monitoring activity to RASMAG.	1/6/04	USA (L. McCormick); All members	Open Completed	RASMAG/3 adopted suitable template and instructions
1/9	Facilitate safety workshop for States as add-on activity to the next RASMAG meeting in accordance with RASMAG/1 report, para 8.5.	1/8/04 RASMAG/34	Secretariat, All members	Open Completed	Superseded by Regional Seminar, Beijing 15-19 Nov 04 Workshop/Seminar will take place over 3 days prior to 2 day RASMAG/3 meeting 3 day ATS Safety Management Seminar scheduled 8-10 June 2005, subsequent to RASMAG/3 meeting on 6 & 7 June. Seminar held during RASMAG/3
1/10	In accordance with RASMAG TOR, review regional and global airspace and ATM implementation plans to identify requirements for airspace safety monitoring and assessment activities.	1/10/04 Report Progress to RASMAG/2345	Secretariat, All members	Open	Ongoing
1/11	Provide update on reporting by States of safety data for airspace safety monitoring programmes in accordance with RASMAG/1 report, para 8.4.	1/10/04 RASMAG/3 4	Secretariat	Open	RASMAG/2 updated, further update due for RASMAG/3

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
					Regional Office is planning an ATM SMS SIP in some South China Sea States during first half of 2005 — RASMAG/3 IP/3 refers Routine RASMAG activity in accordance with TORs and Objectives
2/1	Coordinate current draft end-to-end guidance material with FIT-SEA, FIT-BOB, IPACG and ISPACG, incorporate feedback into the guidance material.	In time to feedback to RASMAG/3	Secretariat	Open Completed	Coordinated with IPACG, ISPACG March 2005, requested feedback by 30 April 2005. Coordinated with FIT-SEA and FIT-BOB April 2005, requesting feedback by 27 May 2005 All feedback incorporated by RASMAG/3
2/2	Issue State letter to States (including Pacific States) who have not provided MAAR or PARMO with up to date TSD, large height deviation reports, RVSM approvals register and airframe height keeping monitoring.	IMMEDIATE	Secretariat	Open Completed	Series of State Letters issued by Regional Office during November/December 2004
2/3	Prepare and deliver on location safety workshop for States.	Confirm to Chairman by Feb 2005 re ability to deliver presentations Report Progress to RASMAG/45	Secretariat All members	Open	Presentations to be sufficiently developed to be delivered to the Workshop/Seminar to be held in conjunction with RASMAG/3 RASMAG/4 reviewed Seminar held during RASMAG/3 and considered compiling a suitable ATS safety management training aid as the basis for further regional safety management training on video and/or DVD. Feedback requested to Regional Office by 15 December 2005. RASMAG/4 considered outcomes of ATS SMS SIP conducted August 2005 and recommended referral to DGCA/43.

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
2/4	Develop SMA Handbook.	Report Progress to RASMAG/345	Chairman (R. Butcher), United States (L. McCormick), All members Secretariat	Open	RASMAG/4 WP/5 refers. Feedback requested to L. McCormick by 15 December 2005.
2/5	Develop guidance on ADS/CPDLC ground system minimum equipment requirements and deployment considerations	Report progress to RASMAG/345	New Zealand (T. Farmer), Japan (Y Nakatsuji, H Matsuda) All members, Secretariat	Open	RASMAG/3 included Japan in responsible parties in respect of expertise in relation to deployment considerations RASMAG/4 WP/8 refers. Feedback requested to T. Farmer by 15 December 2005.
2/6	Prepare submission to the DGCA Conference (Nov 2004) regarding lack of compliance by States with safety monitoring requirements including lack of data submission to RMAs.	November 2004	Secretariat	Open Complete	Secretariat presented DP/5/1 'RASMAG' to 41 st Conference of DGCAs. Action Item DGCA 41/6 raised urging all administrations to fully support RASMAG.
2/7	Clarify discrepancy between RVSM large height deviation categories 'M' & 'N' in use by MAAR and PARMO but not used by Airservices Australia.	November 2004	Australia (R. Butcher)	Open Completed	Australia advised RASMAG/3 that discrepancy had been corrected
2/8	Coordinate the month of December (commencing December 2005) with RVSM/TF as the standard month for traffic sample data (TSD) collection for FIRs under MAAR jurisdiction.	In time to feedback to RASMAG/3	Secretariat, MAAR	Open Completed	Month of December for TSD from December 2005 raised by Secretariat during at least BBACG/16 (IP/5, Feb05), SEACG/12 (WP/13, May05) RVSM/TF/25 (WP/7, March 2005), RVSM/TF/24 (WP/7, Nov04) and routinely during other ICAO meetings.

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
2/9	Provide details of States who have not provided MAAR or PARMO with up to date TSD, large height deviation reports, RVSM approvals register and airframe height keeping monitoring to Secretariat for follow up in accordance with RASMAG/2 work plan item 13.	IMMEDIATE	MAAR, PARMO, Secretariat	Open Completed	As a result of information received from respective RMA's, letters sent by RO to States in accordance with action item 13.
2/10	The RASMAG/2 meeting agreed that in an effort to remove any confusion, a recommendation should be put to APANPIRG to amend APANPIRG Decision 15/5 to read as follows: That, the term Safety Monitoring Agency (SMA) be used to describe an organization approved by regional agreement to provide airspace safety services for international airspace in the Asia/Pacific region for implementation and operation of reduced horizontal separation.	APANPIRG/16 Report progress to RASMAG/4	Secretariat	Open Completed	APANPIRG/16 adopted Decision 16/1 wording: That, the term Safety Monitoring Agency (SMA) be used to describe an organization approved by regional agreement to provide airspace safety services for international airspace in the Asia/Pacific region for implementation and operation of reduced horizontal separation.
3/1	Provide guidance to States in respect of the issues surrounding quantum and application of Target Levels of Safety (TLS).	Report Progress to RASMAG/45	RASMAG members Secretariat	Open	RASMAG/3 discussed "What is a TLS" and agreed to undertake further work in respect of providing guidance to States Referred to RMAs for discussion/action.
3/2	Consider funding issues in respect of the provision of multi national infrastructures e.g. safety monitoring services.	Report Progress to RASMAG/45	RASMAG members Secretariat, including Air Transport Officer	Open	RASMAG/3 noted that difficulties in funding were a significant impediment to the provision of safety monitoring services RASMAG/4 WP/9 & WP/10 refer APANPIRG C16/2 Funding arrangements for regional airspace safety monitoring That, a study group be convened to develop a feasible and sustainable proposal to equip States to organize and finance necessary safety monitoring mechanisms for the provision of safety services for the

RASMAG/4
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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
					international airspaces in the Asia/Pacific region and that States be represented at that meeting by their appropriate legal, financial and organizational experts who would be best equipped and empowered to resolve any difficulties. The study group should report to RASMAG not later than the end of June 2006. 3-day study group meeting to be convened during May-June 2006.
3/3	The RASMAG/3 meeting agreed that a recommendation should be put to APANPIRG/16 in the following terms: <i>Draft Conclusion 16/xx1</i> <i>That, recognizing that some States had not adequately complied with safety management provisions, further implementation of reduced separation minima within the Asia and Pacific Region should only proceed in circumstances where implementing States can demonstrate an ability to comply with Annex 11 Chapter 2 safety management provisions for the continuous monitoring and regular assessment of the safety level achieved.</i>	APANPIRG/16 Report progress to RASMAG/4	Secretariat	Open Closed	APANPIRG C16/5 Implementation of reduced separation unless compliant with Annex 11 That, recognizing that some States had not adequately complied with safety management provisions, the Regional Office advise States of the Asia/Pacific Region that further regional implementation of reduced separation minima should only proceed in circumstances where implementing States can demonstrate an ability to comply with Annex 11, Chapter 2, safety management provisions for the continuous monitoring and regular assessment of the safety level achieved.

RASMAG/4
Appendix G to the Report

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
3/4	The RASMAG/3 meeting agreed that a recommendation should be put to APANPIRG/16 in the following terms: Draft Conclusion 16/xx2 <i>That the non provision by States of safety related data to approved monitoring agencies be included in the APANPIRG Deficiencies List in respect of a deficiency in a safety management system, in order to promote the resolution of these issues.</i>	APANPIRG/16 Report progress to RASMAG/4	Secretariat	Open Closed	APANPIRG C16/6 Non Provision of safety related data by States That the Regional Office advise that States not providing safety related data to approved regional safety monitoring agencies, including RMAs, in accordance with the requirements of safety monitoring agencies will be included in the APANPIRG List of Deficiencies in the ATM/AIS/SAR fields
3/5	RASMAG Chairman to coordinate with Airservices Australia and request that a follow up safety assessment for the South China Sea route structure be completed as soon as possible	Report progress to RASMAG/45	Australia (D. Anderson), Thailand (P. Herabat), Secretariat	Open	RASMAG/4 finalised arrangements for Airservices Australia to conduct one-off safety assessment. Regional Office to coordinate with Airservices and MAAR, data to be collected December 2005.
3/6	Convene tripartite meeting of the three regional RMAs to standardize operations.		Regional RMAs	Closed	The regional RMAs held a meeting to standardise RMA operations and consider, with IATA, mechanisms to ensure widest possible coverage of material from the RASMAG/3 safety seminar. Details included in RASMAG/4 report.
4/1	Identify deficiencies based on non-provision of safety related data by States and raise recommendation to APANPIRG of States for inclusion on Deficiencies List.	Report to RASMAG/5	RMAs, SMAs	On-going	RASMAG/4 reviewed APANPIRG/16 Conclusion 16/6 – Non Provision of safety related data by States That the Regional Office advise that States not providing safety related data to approved regional safety monitoring agencies, including RMAs, in accordance with the requirements of safety monitoring agencies will be included in the APANPIRG List of Deficiencies in the ATM/AIS/SAR fields

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MIDDLE EAST REGIONAL MONITORING AGENCY (MID RMA) BOARD

TERMS OF REFERENCE

The Terms of Reference of the MID RMA Board are as follows:

1. The Board will be responsible for overall supervision, direction, and management of the MID RMA project.
2. The Board will elect a Chairperson.
3. The elected Chairperson will be the contact point/coordinator on behalf of the MID RMA Board members to oversee the MID RMA project in coordination with ICAO.
4. The Board will review and update the MID RMA work plan on a yearly basis and/or whenever required.
5. The Board will meet at least once a year or when deemed necessary to review/update, consider, and approve:
 - i. the MID RMA safety reports;
 - ii. matters related to funding mechanism, costs, accounting, etc;
 - iii. the duties, responsibilities and scope of the MID RMA.
6. The Board through its Chairperson will report to the MIDANPIRG ATM/SAR/AIS Sub-Group.

Composition:

The MID RMA Board will consist of focal point nominated by each participating MID Region State as signatories on their behalf with ICAO Technical Cooperation Bureau (TCB) in relation with the MID RMA project.

The MID RMA Board meetings will be attended by:

- The Board members
- ICAO Regional Office, as permanent observer; and
- Other Organizations (EUROCONTROL, FAA, IATA, etc) as observers on ad-hoc basis and as required.

List of Conclusions and Decisions – MID RMA Board/1 (September 2005)

CONCLUSION 1/1: HOSTING OF THE MID RMA

That, Bahrain hosts the MID RMA.

CONCLUSION 1/2: INITIAL SET UP AND ADMINISTRATIVE MANAGEMENT OF THE MID RMA

That,

a) Bahrain pays for the initial set up of the MID RMA without waiting for MID States contributions and the cost is recovered through the agreed funding mechanism, in coordination with the ICAO Technical Cooperation Bureau; and

b) Bahrain is responsible for the administrative management of the MID RMA.

CONCLUSION 1/3: FUNDING MECHANISM OF THE MID RMA

That,

a) the activities of the MID RMA be ensured through contributions from all MID RMA Member States, which could be recovered in accordance with ICAO Policies on charges for Airports and Air Navigation Services (Doc 9082), in coordination with IATA;

b) the amount of US\$ three hundred thousand (300 000) represents a good estimation of the total cost of the setting up and operation of the MID RMA for the first year;

c) the contribution of States for the first year, be paid on equal basis, as a lump sum based on the estimation here-above and the number of MID RMA Member States;

d) TCB will be responsible for the collection of States' contributions and accounting activity with Bahrain;

e) the contribution for the first year be paid before end of December 2005; and

f) for the coming years:

i) the amount of contribution for each Member State will be revised once every year by the MID RMA Board in coordination with TCB; and

ii) in case the contributions for one year exceeded the yearly cost for the operation and management of the MID RMA, the difference be deducted from the contributions of the next year.

CONCLUSION 1/4: MEMBERSHIP OF THE MID RMA

That,

a) Bahrain, Egypt, Iran, Jordan, Lebanon, Oman, Saudi Arabia and Syria committed themselves to participate in the MID RMA project; and

b) Kuwait and Yemen agreed in principle to integrate into the MID RMA project and an official commitment is to be received before 15 September 2005.

DECISION 1/5: ESTABLISHMENT OF THE MID RMA BOARD

That,

a) a MID RMA Board is established with Terms of Reference (TOR) as at Appendix 4A to the report on agenda item 4; and

b) the MID RMA Board is to be composed of a focal point nominated by each Member State.

CONCLUSION 1/6: MID RMA LETTER OF AGREEMENT

That,

a) ICAO TCB prepares the appropriate updated project documents (LOA and its annexes) for the MID RMA project, taking into consideration the outcome of MID RMA Board/1 meeting;

b) the updated documents be sent to the MID RMA Board members for comment as soon as possible; and

c) the final version of the documents be sent to States for signature before 30 September 2005.

CONCLUSION 1/7: SUPPORT FROM EUROCONTROL AND FAA

That, the MID Region makes use of the support to be provided by both EUROCONTROL and FAA in providing the necessary training, data, software, and documentation and make available expertise in support of both the setting up of the MID RMA and also in the provision of long term support.

CONCLUSION 1/8: ACTION PLAN FOR THE RE-ESTABLISHMENT OF THE MID RMA

That, further to MIDANPIRG/9 Conclusion 9/13, the Action Plan for the re-establishment of the MID RMA, its duties and responsibilities and the guiding principles be updated as at Appendices 7A, 7B and 7C to the report on agenda item 7, respectively.

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

(Changes proposed after APANPIRG/15 are shown in strikeout and underlining.)								
Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>ATS Routes</u>								
Requirements of Part V.III, Table ATS 1 of the Air Navigation Plan	Hong Kong, China/Japan	A202 – Partially-implemented —	24/11/93	Hong Kong-Bangkok segment was implemented on 1 November 2001. Japan considering implementation as a conditional route.	Japan – co-ordinate Hong Kong, China	Hong Kong, China/ Japan	HongKong-Bangkok segment 1/11/2001; Hong Kong-Chitose segment TBD Review by ARNR/TF	B
	China/Hong Kong, China	A203 – Not implemented	24/11/93	China advises no international flight requirements.	China requested deletion and amendment to BANP.	China/Hong Kong, China	Subject to BANP amendment.	B
	Indonesia	A211 – Partially-implemented	24/11/93	ICAO has requested Malaysia to co-ordinate the early implementation of A211 with States concerned. Malaysia has advised at SEACG/40 of the implementation of the route within Malaysia on 29 November 2001.	Indonesia – implement the missing segment ICAO – coordinate the implementation with Indonesia	Indonesia ICAO	29/11/2001 (by Malaysia) TBD by Indoensia. Review by ARNR/TF	B

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	China/Russian Federation	A218 – Partially implemented in Russia and Alaska	24/11/93	ICAO has taken action to co-ordinate with China/Russian Federation for implementation of Harbin-Elkimchan segment and to amend ANP. APAC 99/1-ATS was approved on 26/1/00. CAAAC subsequently advises (14 Apr 03) that current route G212 meets the requirements and the proposed A218 is no longer required.	China requested deletion and amendment to BANP.	China/ Russian Federation ICAO	Subject to BANP amendment. — Review by ARNR/TF	B
	Japan	A223 – Not implemented	24/11/93	Japan has advised that a domestic route network covers the route.	Japan – consider implementation as a conditional route.	Japan	TBD Review by ARNR/TF	B

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	China/Mongolia/Russian-Federation	A335 – Partially-implemented	24/11/93	China and Mongolia advised that this segment is covered by other ATS routes properly; thus will has proposed its deletion from ANP. China reported to APANPIRG/14 the portion between HOHHOH – TUMURTAI was implemented.	China, Mongolia – propose-BANP amendment	China/Mongolia	Deletion of A335 notified 9 Oct-01 Subject to BANP amendment.	B
	Indonesia/Malaysia	A341 – Partially-implemented	24/11/93	ICAO has requested Indonesia to co-ordinate implementation with Malaysia. Malaysia has advised that the existing route B584 fulfils sufficiently the requirement and would propose the deletion of the requirement for Syrabaya-Kota-Kinabalu segment.	Indonesia/Malaysia – consider-full implementation	Indonesia/Malaysia	12/2001 Review by ARNR/TF	B

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	Indonesia/United States	A450 – Partially-implemented	24/6/94	ICAO has requested Indonesia to co-ordinate implementation with United States. United States has agreed to the implementation, and a response from Indonesia is being awaited.	Indonesia/United States – consider full implementation	Indonesia/United States	TBD Review by ARNR/TF	B
	Viet Nam	A469 – Implemented as W9 before. As of 1 Nov 2001 implemented as L643.	19/8/94	ICAO has requested Viet Nam to implement as A469. Viet Nam advised that W9 was replaced with L643 on 1 November 2001.	Viet Nam – propose deletion of the requirement as A469 – ICAO process BANP amendment	Viet Nam – ICAO	Subject to BANP amendment.	B
	India/Nepal	A473 - Not implemented	16/3/99	A new proposal was submitted in mid 2003 by Nepal. This is being coordinated by AAI with defense authorities.	India/Nepal - implement the route	India/Nepal	<u>Item captured in Chapter 2 of the Route Catalogue.</u>	B
	Thailand	A581 – Partially-implemented	17/2/97	China, Lao PDR and Thailand proposed an amendment to ANP. ICAO processed APAC99/11 in co-ordination with China/Myanmar/Thailand. APAC99/1 was approved on 15 December 2000.	Thailand – implement accordingly.	Thailand	Review by ARNR/TF.	B

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	United States	A584 – Partially-implemented	24/6/94	ICAO has requested United States to implement the missing segment. United States has proposed deletion of the missing segment, and the proposal is under preparation.	ICAO – process an amendment in co-ordination with United States.	United States ICAO	Subject to BANP amendment.	B
	Fiji/New Zealand	B201 – Not implemented	24/11/93	Fiji/New Zealand have advised that they agreed to delete the requirement. ICAO will process ANP amendment as this was covered by routes B575, G457 and R327.	Fiji/New Zealand – propose an amendment to delete the requirement in BANP	Fiji/New Zealand ICAO	Subject to BANP amendment.	B
	Maldives	B204 – The requirements for this route are not detailed in BANP	24/1/96		Maldives – propose an amendment to ANP to add the route.	Maldives ICAO	Subject to BANP amendment	B
	Japan/Rep of Korea	B212 – Not implemented	24/11/93	Japan is considering implementation as a conditional route and will coordinate with Republic of Korea.	Japan/Rep of Korea – consider implementation	Japan/Rep of Korea	12/2005 Review by ARNR/TF.	B

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	Papua New Guinea	B456 – Partially implemented	24/11/93	Papua New Guinea has advised that they will formally propose ANP amendment for deletion of the missing segment.	Papua New Guinea – propose an amendment to BANP. ICAO process BANP amendment.	Papua New Guinea – ICAO	Subject to BANP amendment.	B
	China	B591 - Partially implemented	22/7/97	Co-ordination is in progress among States and ICAO.	ICAO – continue on-going implementation co-ordination related to the Revised South China Sea route structure with States. China will consider for future implementation.	China	TBD Review by ARNR/TF. <u>Captured in Chapter 2 of the Route Catalogue</u>	B
	Indonesia	G461 - Implemented with different route specification	24/11/93	ICAO co-ordinated with Indonesia to amend BANP requirement. APAC00/1-ATS was approved on 15 January 2001.	Indonesia implement the requirement accordingly.	Indonesia	<u>Implemented with different route specification. Amendment Proposal to be submitted. Captured in Chapter 3 of the Route Catalogue.</u>	B
	Cambodia/Philippines/Thailand/Viet Nam	G473 - Partially implemented	24/11/93	Co-ordination is in progress among States and ICAO.	ICAO - continue ongoing implementation co-ordination related to the Revised South China Sea route structure with States	Cambodia /Philippines Thailand/Viet Nam/ICAO	<u>Captured in Chapter 2 of the Route Catalogue.</u>	B
	DPR Korea/ Rep of Korea	G589 – Not implemented	24/11/93		B467 established instead of G589 April 1998	DPR Korea/ Rep of Korea	April 1998 completed Review requirement for G589 by ARNR/TF	B

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	China/Kazakhstan	R216 - Not implemented	24/11/93	CAAC advises current route B215 KUQA A460 REVKI to Alma Ata meets the requirements for traffic from Urumqi to Alma Ata and requests deletion of R216 from BANP (14 Apr 03).	CAAC proposed deletion- will coordinate with Kazakhstan to delete R216 from BANP	China/Kazakhstan ICAO	<u>Captured in Chapter 2 of the Route Catalogue.</u>	B
	China	R333 - Not implemented	24/11/93	China is considering future implementation.	China and Hong Kong, China co-ordinating with Hong Kong CAA	China	TBD Review by ARNR/TF	B
	China/Hong Kong, China	R335 - Not implemented	24/11/93	CAAC advises no international flight requirements and requests deletion from ANP (14 Apr 03).	China proposed deletion and amendment to BANP	China/Hong Kong, China ICAO	Subject to BANP amendment.	B
	Cambodia/Lao PDR/Thailand	R345 - Not implemented	24/11/93	Cambodia has advised that the requirement is no longer valid and will propose the deletion of requirement in consultation with Lao PDR and Thailand.	ICAO - continue ongoing implementation co-ordination related to the Revised South China Sea route structure with States Cambodia- coordinate the deletion with IATA as well as Lao PDR and Thailand	Cambodia/Lao PDR/ Thailand	<u>Captured in Chapter 2 of the Route Catalogue.</u>	B

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	Indonesia	R459 - Implemented as W51 and W36	24/11/93	ICAO has requested Indonesia to implement as R459.	Indonesia, Singapore - consider promulgation implementation of the route with designator R459 L504 in AIP	Indonesia/Singapore	TBD Implementation by _____ Indonesia 25/11/2004 Singapore 20/1/2005 Review by ARNR/TF To be implemented as L504. Target implementation date TBD	B
	Russian Federation	R466 - Implemented as R446 in Russian Federation. Route requirement is listed in EUR/NAT-ANP	24/11/93	ICAO has requested Russian Federation to delete R221 and promulgate the route as R466 in AIP. Implemented as R446.		Russian Federation ICAO	Coordination with the Paris Office to amend ANP	A
	Indonesia/Malaysia	R579 - Not implemented	24/11/93	ICAO has requested Malaysia to co-ordinate with Indonesia for implementation. Malaysia considered there was no longer requirement due to a low traffic movement; thus will propose the deletion.	Indonesia/Malaysia - consider implementation.	Indonesia	12/2001 Review by ARNR/TF	B
	India/Oman	R593 - Not implemented	24/11/93	India advised ATM/AIS/SAR/SG/14 that India and Oman had agreed to delete.	India proposed deletion and amendment to ANP	India/Oman	Subject to ANP amendment.	B
WGS-84								

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
Requirements of Paragraph 3.6.4 of Annex	Bhutan	WGS-84 - Not implemented	2/7/1999	Data conversion completed, but not published		Bhutan	TBD	A
	Cambodia	WGS-84 - Partially implemented	28/6/2001	Cambodia reported ICAO on 22 June 2004 that the WGS-84 coordinates have been implemented in international airports, airspace and international routing.		Cambodia	TBD	A
	China	WGS-84 - Not implemented * implemented in the Sanya AOR as of 1 Nov 2001	2/7/1999	Differences to Annex 15 - <i>Aeronautical Information Services</i> are notified		China		A
	DPR Korea	WGS-84 - Not implemented				DPR Korea	TBD 2004	A
	Kiribati	WGS-84 - Not implemented				Kiribati	TBD	A
	Malaysia	WGS-84 - Partially implemented		In progress. Updated information received. Confirmation of completion date required.		Malaysia	December 2002. <u>In AIP</u>	A
	Nauru	WGS-84 - Not implemented		Conferring with consultant		Nauru	TBD	A
	Philippines	WGS-84 - Implemented at main airports		on-going		Philippines	2003-2004-2006	A
	Solomon Islands	WGS-84 - Not implemented				Solomon Islands	1999	A
	Vanuatu	WGS-84 - Implemented at main airports	2/7/1999			Vanuatu	1999	A

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
Type of ATS								
Requirements of Part II, Table ATS 3D of the air navigation plan	India	Some ATS route segments in part of Mumbai FIR are subject to Advisory Services	24/11/93	Co-ordination in progress through BBACG. HF radio being modernized and datalink being installed.	India - implement Area Control Services	India	Modernization of HF radio by the end of 2004 CPDLC by the end of 2005	A

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
Airspace Classification								
Requirements of Paragraph 2.6 of Annex 11	China	Airspace Classification - Not implemented	7/7/99		Difference to Annex 11 is published in AIP, China.	China		A
	Cook Islands	Airspace Classification - Not implemented	7/7/99			Cook Islands	TBD	A
	DPR Korea	Airspace Classification - Not implemented	7/7/99			DPR Korea	TBD 2005	A
	Japan	Airspace Classification - Not Partially implemented	2/19/04		Implementation in oceanic airspace in progress	Japan	Domestic airspace complete, final stage of oceanic airspace classification will occur on AIRAC 29 September 2005	A
	Kiribati	Airspace Classification - Not implemented	7/7/99			Kiribati	TBD	A
	Nauru	Airspace Classification - Not implemented	7/7/99			Nauru	TBD	A
	Papua New Guinea	Airspace Classification - Not implemented	7/7/99			Papua New Guinea	mid-2001 Official confirmation pending- Project in place, anticipated implementation first quarter 2006	A
	Samoa	Airspace Classification - Not implemented	7/7/99		CTR C and D Samoa Sector Class G	Samoa	Completed Official confirmation required	A
	Solomon Islands	Airspace Classification - Not implemented	7/7/99			Solomon Islands	TBD	A
	Viet Nam	Airspace Classification - Not implemented	7/7/99			Viet Nam	2003/2004 Some work is being carried out, expected completion 2006	A

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>AIP Format</u>								
Requirements of Chapter 4 of Annex 15	Cook Islands	AIP Format - Not implemented	7/7/99			Cook Islands	TBD	A
	Kiribati	AIP Format - Not implemented	7/7/99			Kiribati		A
	Lao PDR	AIP Format - Not implemented	7/7/99			Lao PDR	Sep 2003+H6	A
	Myanmar	AIP Format - Not implemented	7/7/99			Myanmar	Completed 2003 (To be published) AIP published 2005	A
	Nauru	AIP Format - Not implemented	7/7/99			Nauru	TBD	A
	Papua New Guinea	AIP Format - Not implemented	7/7/99	under development		Papua New Guinea	TBA, under review during 2006	A
	Samoa	AIP Format - Not implemented	7/7/99			Samoa	5/15/2003 (to be confirmed)	A
	Tonga	AIP Format - Not implemented	7/7/99		Under preparation —	Tonga	2004 AIP published with effect- 14 April 2005	A
<u>SAR capability</u>								
Requirements of Annex 12	Cambodia	Annex 12 requirements not implemented. No agreements with adjacent States.	20/2/97		Cambodia - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cambodia	TBD-SAR agreement established with Viet Nam February 1999	U

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	Cook Islands	Annex 12 requirements not implemented. No agreements with adjacent States.	31/1/95	SAR agreement with New Zealand under development	Cook Islands - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cook Islands	2004	U
	Maldives	Annex 12 requirements not implemented. No agreements with adjacent States.	24/4/97	SAR services and facilities provided (details to be confirmed). SAR agreements with neighbouring States under development	Maldives - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Maldives	2004	U
<u>Carriage of ACAS II</u>		ACAS II required for aeroplanes in excess of 15,000kg or 30 pax.						
Requirement of Chapter 6 of Annex 6	Bhutan	Annex 6 requirement not implemented.	26/8/05		Bhutan - implement Annex 6 as required.	Bhutan	TBD	U
	Cook Islands	Annex 6 requirement not implemented.	26/8/05		Cook Island - implement Annex 6 as required.	Cook Islands	TBD	U
	Kiribati	Annex 6 requirement not implemented.	26/8/05		Kiribati - implement Annex 6 as required.	Kiribati	TBD	U
	Marshall Islands	Annex 6 requirement not implemented.	26/8/05		Marshall Islands - implement Annex 6 as required.	Marshall Islands	TBD	U
	Micronesia	Annex 6 requirement not implemented.	26/8/05		Micronesia - implement Annex 6 as required.	Micronesia	TBD	U

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	<u>Nauru</u>	<u>Annex 6 requirement not implemented.</u>	<u>26/8/05</u>		<u>Nauru - implement Annex 6 as required.</u>	<u>Nauru</u>	<u>TBD</u>	<u>U</u>
	<u>Palau</u>	<u>Annex 6 requirement not implemented.</u>	<u>26/8/05</u>		<u>Palau - implement Annex 6 as required.</u>	<u>Palau</u>	<u>TBD</u>	<u>U</u>
	<u>Papua New Guinea</u>	<u>Annex 6 requirement not implemented.</u>	<u>26/8/05</u>		<u>Papua New Guinea - implement Annex 6 as required.</u>	<u>Papua New Guinea</u>	<u>TBD</u>	<u>U</u>
	<u>Philippines</u>	<u>Annex 6 requirement not implemented.</u>	<u>26/8/05</u>		<u>Philippines - implement Annex 6 as required.</u>	<u>Philippines</u>	<u>TBD</u>	<u>U</u>
	<u>Solomon Islands</u>	<u>Annex 6 requirement not implemented.</u>	<u>26/8/05</u>		<u>Solomon Islands - implement Annex 6 as required.</u>	<u>Solomon Islands</u>	<u>TBD</u>	<u>U</u>
	<u>Vanuatu</u>	<u>Annex 6 requirement not implemented.</u>	<u>26/8/05</u>		<u>Vanuatu - implement Annex 6 as required.</u>	<u>Vanuatu</u>	<u>TBD</u>	<u>U</u>
<u>Carriage of Pressure Altitude Reporting Transponder</u>		<u>Pressure altitude reporting transponder required for all aeroplanes since since 1/1/02.</u>						
<u>Requirement of Chapter 6 of Annex 6</u>	<u>Bangladesh</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Bangladesh - implement Annex 6, Annex 10 as required.</u>	<u>Bangladesh</u>	<u>TBD</u>	<u>U</u>
	<u>Bhutan</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Bhutan - implement Annex 6, Annex 10 as required.</u>	<u>Bhutan</u>	<u>TBD</u>	<u>U</u>
	<u>Cambodia</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Cambodia - implement Annex 6, Annex 10 as required.</u>	<u>Cambodia</u>	<u>TBD</u>	<u>U</u>
	<u>Cook Islands</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Cook Island - implement Annex 6, Annex 10 as required.</u>	<u>Cook Islands</u>	<u>TBD</u>	<u>U</u>

APANPIRG REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	<u>DPR Korea</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>DPR Korea - implement Annex 6, Annex 10 as required.</u>	<u>DPR Korea</u>	<u>TBD</u>	<u>U</u>
	<u>New Caledonia</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>New Caledonia - implement Annex 6, Annex 10 as required.</u>	<u>New Caledonia</u>	<u>TBD</u>	<u>U</u>
	<u>Kiribati</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Kiribati - implement Annex 6, Annex 10 as required.</u>	<u>Kiribati</u>	<u>TBD</u>	<u>U</u>
	<u>Lao PDR</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Lao PDR - implement Annex 6, Annex 10 as required.</u>	<u>Lao PDR</u>	<u>TBD</u>	<u>U</u>
	<u>Marshall Islands</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Marshall Islands - implement Annex 6, Annex 10 as required.</u>	<u>Marshall Islands</u>	<u>TBD</u>	<u>U</u>
	<u>Micronesia</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Micronesia - implement Annex 6, Annex 10 as required.</u>	<u>Micronesia</u>	<u>TBD</u>	<u>U</u>
	<u>Nauru</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Nauru - implement Annex 6, Annex 10 as required.</u>	<u>Nauru</u>	<u>TBD</u>	<u>U</u>
	<u>Palau</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Palau - implement Annex 6, Annex 10 as required.</u>	<u>Palau</u>	<u>TBD</u>	<u>U</u>
	<u>Papua New Guinea</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Papua New Guinea - implement Annex 6, Annex 10 as required.</u>	<u>Papua New Guinea</u>	<u>TBD</u>	<u>U</u>
	<u>Philippines</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Philippines - implement Annex 6, Annex 10 as required.</u>	<u>Philippines</u>	<u>TBD</u>	<u>U</u>
	<u>Solomon Islands</u>	<u>Annex 6, Annex 10 requirements not implemented.</u>	<u>26/8/05</u>		<u>Solomon Islands - implement Annex 6, Annex 10 as required.</u>	<u>Solomon Islands</u>	<u>TBD</u>	<u>U</u>

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ICAO Safety Management Manual

2005

International Civil Aviation Organization

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