INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE SECOND MEETING OF THE REGIONAL AIRSPACE SAFETY MONITORING ADVISORY GROUP (RASMAG/2)

BANGKOK, THAILAND, 4 – 8 OCTOBER 2004

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

TABLE OF CONTENTS

PART I - HISTORY OF THE MEETING

PART II - REPORT ON AGENDA ITEMS

APPENDICES

PART I – HISTORY OF THE MEETING

1. Introduction

1.1 The Second Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/2) was held in Bangkok from 4 to 8 October 2004 at the Kotaite Wing of the ICAO Asia/Pacific Office.

2. Attendance

2.1. The meeting was attended by 18 experts from Australia, Hong Kong China, India, Japan, New Zealand, Singapore, Thailand, United States, IATA and IFATCA. A list of participants is at **Appendix A** to this report.

3. Officers & Secretariat

3.1. Mr. Robert Butcher, Safety Manager, Airservices Australia acted as Chairperson and presided over the meeting throughout its duration.

3.2. Mr. David J. Moores, Regional Officer ATM, was the Secretary for the meeting and was assisted by Mr. Andrew Tiede, Regional Officer ATM.

4. Opening of the Meeting

4.1 The meeting was opened by Mr. David J. Moores on behalf of Mr. Lalit Shah, Regional Director of the Asia/Pacific Regional Office, who welcomed the participants to Bangkok and this second meeting of the RASMAG. Mr. Moores noted the good work undertaken in the first meeting of RASMAG in establishing the way forward for the group and hoped that this second meeting would be able to effectively build on that work.

4.2 Mr. Robert Butcher as Chairperson of RASMAG welcomed the participants and mirrored Mr. Moores' comments by saying he was confident that RASMAG/2 would be able to commence some of the vital work required to develop guidance material for States with regards to safety matters associated with CNS/ATM implementations. He reiterated the need for RASMAG to consider ways in which States without effective safety management systems or who lacked sufficient capability to provide the necessary data for safety assessments, to be assisted in achieving these important goals.

5. Language and Documentation

5.1. All discussions were conducted in English. Documentation was issued in English. A total of 15 Working Papers and 7 Information Papers were considered by the meeting. A list of the Working and Information Papers is at **Appendix B**.

PART II - REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of Agenda

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

Agenda Item 1: Adoption of Agenda

Agenda Item 2: Review the Terms of Reference

Agenda Item 3: Review and update RASMAG/1 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

Agenda Item 5: Review regional and global airspace planning and implementation developments and provision of airspace safety monitoring services

Agenda Item 6: Airspace safety monitoring documentation and regional guidance material

Agenda Item 7: Inter-regional coordination

Agenda Item 8: Any other business

Agenda Item 9: Date and venue of the RASMAG/3 Meeting

Agenda Item 2: Review of Terms of Reference

2.1 The meeting noted that the APANPIRG/15 meeting (23 – 27 August 2004) had reviewed the Report of RASMAG/1 and under Decision 15/4, agreed to the recommendation of RASMAG/1 to change its terms of reference (TOR) to address coordination with the contributing bodies of APANPIRG and to amend the task list to include “data link”.

2.2 The meeting reviewed the revised terms of reference and task list, and agreed that these met the requirements of the Group.

Agenda Item 3: Review and update RASMAG/1 Task List

3.1 The meeting reviewed and revised the work plan as shown in **Appendix C** and agreed that this met the work programme of the group.

3.2 The meeting further discussed Item 9 from the work items identified at RASMAG/1 and expressed disappointment at the fact that the proposed safety workshop could not be accommodated as part of RASMAG/2. The Secretariat regretted that because of a clash with the Regional ATS Safety Management Seminar to be held in Beijing on 15-19 November 2004, the Regional Office was unable to arrange for the RASMAG safety workshop at this meeting. However, the meeting agreed that the need for such a workshop was still very pertinent specifically as both MAAR and PARMO had indicated in their

reports that some States were still finding it difficult to provide the required data for safety monitoring purposes. The meeting again highlighted the need for RASMAG to provide some guidance and assistance to these States so that the safety assessment processes could be effectively completed. Additionally, the meeting regarded the provision of such assistance as being a major step in helping establish robust safety management systems throughout the region.

3.3 IATA commented that the need to enhance the safety systems and processes of States was a major priority but recognized that it was difficult for some States to travel to attend safety workshops or related meetings. As a result, IATA kindly offered to facilitate travel arrangements for RASMAG representatives if the meeting decided to take the safety workshop to those States identified as most needing assistance. IATA reminded the meeting that such a process had been used historically within the region, for example to aid in the implementation of RNAV. The Chairman noted that a similar process had been used with Y2K planning and suggested that perhaps a "core team" approach could be utilized by RASMAG to facilitate the workshops where the subject matter would be specifically targeted to assist the identified States to meet their responsibilities in regards to provision of safety monitoring data.

3.4 The meeting discussed these proposals in detail and thanked IATA for their kind offer. The meeting agreed that in the first instance, a safety workshop/seminar should be convened for 3 days coincident with the next planned RASMAG meeting during the second quarter of 2005. The aim of the workshop would be to provide information and guidance to States within the region in relation to safety management systems in general; the need for safety assessments and safety monitoring of various implementation activities; and information on organizations that could provide the expertise to assist States with implementing safety processes. Additionally, the workshop would provide guidance on State responsibilities to provide data to relevant monitoring agencies and how best to provide this data. The meeting agreed that the workshop should be open to all States within the Region and that States identified as most needing assistance should be encouraged by RASMAG member States to attend.

3.5 The meeting also discussed follow up action that may need to be taken following the safety workshop, and agreed that States who had been identified as needing assistance, and who were unable to attend the workshop, would be visited by a core team from RASMAG made up of relevant experts, to provide a workshop in situ.

3.6 To progress the development of the workshop proposal, the Chairman, and members from Hong Kong China and Singapore, suggested a number of suitable topics that could be used as an agenda of presentations for the workshop as detailed in the table below.

Topic No.	***Topic***	***Presenting State***
1	The Need for and Fundamentals of Safety Management Systems	AUSTRALIA
2	The Need for Safety Assessments and Safety Monitoring in reduced vertical and horizontal separation implementations.	USA
3	Collision Risk Modeling, Technical Risk, Risk from Operational Errors, Target Level of Safety – An explanation in simple terms	USA
4	How Safety Assessments and Monitoring are Conducted – The Essential Elements. What States need to provide.	USA/MAAR
5	Hazard Identification Methodologies and Hazard Mitigation Strategies. Including State examples.	AUSTRALIA HONG KONG
6	Description of the Roles, Responsibilities and Functions of Airspace Safety organizations – RASMAG, RMAs, SMAs, CRAs, FITs etc	ICAO

Topic No.	*Topic*	*Presenting State*
7	MAARs Activities with regards to RVSM safety assessments, traffic sampling, State reporting formats, analyses and reporting.	MAAR
8	The Role of the airlines in risk assessment activities and their contribution to safety analyses undertaken by States.	IATA
9	Step by Step Description of Implementation of Regional or State activities such as RVSM, RNP, Data link using examples. What is required to be planned for and accomplished from a safety perspective prior to and post implementation.	JAPAN ISPACG
10	End to End monitoring of Data link – What is needed for implementation.	JAPAN
11	Implementation of ICAO Safety Management Requirements. State examples	HONG KONG

3.7 This agenda was discussed by the meeting and RASMAG members were asked to review it before February 2005 and confirm with the Chairman an intention to provide presentations at the workshop. The meeting requested the Secretariat to facilitate the planning for the workshop at the RASMAG/3 meeting. The Secretariat agreed that this would be progressed as requested.

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

4.1 The meeting recalled that at RASMAG/1, it was agreed that it was necessary to establish safety monitoring groups to undertake the safety management programmes for the application of required data link services and related horizontal separation minima.

4.2 The following areas were identified as requiring a safety monitoring group to be established for airspace safety monitoring services and safety assessments in the Asia Region:

a) South China Sea area, for the safety assessment of the RNP 10 route structure and reduced horizontal separation, and application of data link services;

b) RNP 10 routes across the Bay of Bengal area, for the safety assessment and monitoring of the routes, reduced horizontal separation, and application of data link services; and

c) RNP 10 routes from South-East Asia to the Middle East, for the safety assessment and monitoring of the routes, reduced horizontal separation, and application of data link services.

4.3 The meeting noted in regard to a) above, that the Civil Aviation Authority of Singapore was the designated Monitoring Authority (MA) for the collection and collation of the navigation performance data for the SCS routes. The States concerned have a Letter of Agreement in place requiring the reporting of gross errors of 15 NM and greater for the RNP 10 routes to the MA.

4.4 The meeting noted the outcome of the APANPIRG/15 meeting review of the report of RASMAG/1 and its recommendation to adopt the term safety monitoring agency (SMA). APANPIRG/15 agreed to the recommendation under Decision 15/5. However, the meeting further noted that in describing a safety monitoring agency, APANPIRG/15 (paragraph 2.1.61 of the Report on Agenda item 2.1 refers)

referred to an organization "that provided all safety management services for an airspace and would include the RMA when this function was being carried out". However, Decision 15/5 states "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 RNP, reduced horizontal separation and data link."

4.5 The meeting considered that the foregoing wording did not accurately describe what an SMA was meant to be and could result in some confusion. Further detailed discussion took place and IATA highlighted the need for a clear distinction between the monitoring or assessment of technical performance and the assessment of the safety of a particular implementation. IATA reminded the meeting that CRAs and FITs monitor technical performance but do not assess system safety. The latter task was the role of an SMA in the case of reduced horizontal separation. As a result the meeting agreed that in an effort to remove any confusion, a recommendation should be put to APANPIRG to amend 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.*

4.6 The meeting also discussed the need to develop some form of guidance material for SMAs and the Chairman proposed that a document could be developed along the lines of the RMA Handbook recently developed and agreed to by RMAs. Following further discussion on the contents of such a handbook, the meeting agreed that as a minimum, what would be required was a guide to the safety assessment actions needed for the implementation of reduced horizontal separation, such as the assessment being undertaken by ISPACG for the implementation of 30NM lateral /30NM longitudinal separation minima utilizing ADS. The Chairman, in conjunction with the member from the USA, agreed to draft a document for distribution to and consideration by RASMAG members before the next meeting.

4.7 In considering what organizations could provide SMA services, it was noted that to date, monitoring for RVSM, reduced horizontal separation minima, data link services, and the performance of safety assessments had been carried out by a few specialized teams made up of technical experts and contractors supporting States within the region. The meeting was informed that other commercial organizations had expressed an interest in being considered for this activity.

4.8 The United States recommended that commercial service providers could be employed by a State or group of States to provide needed regional airspace safety monitoring agency services. The meeting recognized that opportunities for competitive bidding existed and this could be a way of enhancing budgetary considerations and making use of available expertise in the commercial sector.

4.9 The Secretariat drew attention to the requirement that States be responsible for the provision of safety services for their FIRs. Therefore, it would be a matter for the State concerned to determine how and who would provide these services, bearing in mind that they must comply with the relevant ICAO SARPs. In the case of the Bay of Bengal, States jointly agreed to appoint a commercial service provider (Boeing) to provide the CRA services as described above. There were many other examples of commercial bodies providing such services for States under commercial arrangements.

4.10 The meeting considered that the *Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region* under development by RASMAG could serve as a means for a State or group of States to determine the capability of an organization to provide ATS data link performance monitoring services.

Review of RMA activities

4.11 The meeting recalled that, in addition to the two established RVSM RMAs appointed by APANPIRG, i.e. MAAR for the specified FIRs in Asia Region and PARMO for the specified FIRs in the Pacific Region, the RASMAG/1 meeting had recognized that Airservices Australia was also responsible for RVSM operations and associated safety management services west of a line 12 NM east of the east coast of Australia (i.e. that international airspace for which PARMO was not the approved RMA). Also, it was noted that Airservices had provided the safety assessment services for the implementation of the South China Sea and Bay of Bengal route systems and associated reduced lateral separation. They were also providing similar and additional safety services for data link services in the international airspace of the Brisbane and Melbourne FIRs that included the airspace of the southern Indian Ocean.

4.12 In light of the above, RASMAG/1 had recommended to APANPIRG/15 that Airservices Australia be designated as an RMA and SMA for the airspace where it was undertaking this responsibility. In this regard, APANPIRG/15 under Conclusion 15/6 agreed to the RASMAG/1 recommendation and designated Airservices Australia as the RVSM RMA and SMA, as well as to provide safety services for the implementation of data link for the specified airspace.

Report of Airservices Australia's RMA activities

4.13 Australia on behalf of Airservices Australia's RMA (AsAR), submitted a report on a limited review undertaken of the airspace safety related to RVSM operations within the Australian RMA area of responsibility. The review was limited to an assessment of operational errors, as resource constraints have prevented quantitative assessment of the risk in terms of the required target level of safety (TLS). A more detailed annual review that included an assessment of the achieved level of safety and compared this to the established TLS covering the period 1 January to 31 December 2004 would be provided to RASMAG at its next meeting.

Post-implementation review of RVSM safety assessment

4.14 The meeting recalled that RVSM was implemented across the whole of the Brisbane and Melbourne FIRs on 1 November 2001 using a unique non-exclusive airspace model. In June 2002, Airservices Australia undertook a post-implementation review of RVSM within the Brisbane and Melbourne FIRs that computed the technical risk as 1.46×10^{-10}, and the overall weighted risk as 4.17×10^{-9}. This met the required TLS of 5.0×10^{-9}.

4.15 Further, the June 2002 review identified that for the portion of the Brisbane and Melbourne FIRs covering the international airspace in the Indian Ocean (North West of Australia), there were 65 minutes of operational errors for an estimated 2063 flights of average duration 1.4 hours, resulting in a risk estimate due to operational errors of 7.36×10^{-8}. The majority proportion of these operational error times were caused by two operational errors of significant duration which were not directly related to the application of RVSM.

4.16 The meeting appreciated the information provided and noted that an annual report would be available for the next RASMAG/3 meeting.

Review of operational errors

4.17 Airservices had reviewed operational errors covering the period from 1 January to 30 June 2004. The operational errors were assessed to determine the time periods where an aircraft was not at its correct level within RVSM airspace and ATC was not aware of the deviation. For the subject period, the total time was 37 minutes. With the exception of one incident report (5 minutes), which occurred in Australian continental airspace, all the reports related to Australia's Indian Ocean airspace. A review of

the reports showed a significant problem regarding boundary coordination with adjacent FIRs in the international airspace to the north-west of Australia. However, the highest proportion of the time (14 minutes) applicable to operational errors was for those incidents classified as OTHER, which generally comprised single events of specific characteristics. Conclusions regarding the affect of these operational errors on the achieved level of safety would be determined in the short term with a comprehensive assessment being undertaken at the end of December 2004 and reported to RASMAG in early 2005.

4.18 The meeting appreciated the report provided by Australia and noted with concern the number of operational errors involving an adjacent ATS provider. Australia advised the meeting that follow up action had been taken with the responsible parties, and through longstanding coordination arrangements established by bi-lateral agreement, operational problems were regularly being discussed. The meeting, whilst appreciating that effective coordination between the two parties was ongoing, was of the view that the Secretariat should consider undertaking a mission to the State (s) concerned in the near term to assess the safety management practices in respect to RVSM operations, the incident reporting procedures in place and any follow-up mitigation action taken on operational errors. The Secretariat agreed to consider whether such a mission could be undertaken in the short term given the available resources.

Report of MAAR's RMA activities

4.19 MAAR presented a draft of their annual report of airspace safety review of RVSM implementation and operation in the Bay of Bengal airspace which involved 15 FIRs. The review was conducted based on a one-month traffic sample data collected in July 2004. It was important to note that not all States had provided suitable traffic sample data for analysis and the overall results of the analysis would therefore have to be updated when this data became available.

4.20 The number of flights in the traffic data was broken down into various categories and summarized as shown below:

a) daily flights operating in the FIR;

b) the top-50 State pairs, based on FIR-flights (charts showed for each State pair, traffic in both direction);

c) top-50 city pairs, based on FIR-flights (chart showed, for each city, traffic in both directions);

d) top 50 commercial operators, in terms of total FIR-flights between FL290 to 410 inclusive (these operators represent over 90 percent of the operations observed in the sample);

e) the aircraft types observed in the various FIR samples were combined into aircraft groups (the number of FIR-flights of the top 50 aircraft group were depicted); and

f) the flight level utilization in the RVSM airspace between FL 290 to 410 inclusive were depicted.

4.21 MAAR drew attention to a principal responsibility of an RMA, which is to establish and maintain a central registry of State RVSM approvals of operators and aircraft using RVSM airspace. The MAAR RVSM approval registry database established since 27 September 2003 formed part of the global approvals registry database and the details were summarized in its report. The complete details of RVSM approval registry records are available on the MAAR website (www.aerothai.co.th/maar).

4.22 Based on the traffic sample data of the number of aircraft operating in the RVSM airspace, this indicated that the database containing RVSM approval data should be more extensive. Thus, it was very likely that there were aircraft and operators using the RVSM airspace that were not listed in the database. Accordingly, MAAR requested the concerned States to provide RVSM approval records of all registered aircraft to MAAR as soon as possible.

Large height deviation reports

4.23 Based on the requirement of safety monitoring for the RVSM implementation in Asia Region, all concerned States were required to submit large height deviation (LHD) reports to MAAR on a monthly basis. The LHD reports were used to estimate risks from technical and operational errors, which would facilitate the completion of the safety oversight for the Asian airspace where RVSM was implemented. In summary, there were 9 LHD occurrences in the Bay of Bengal, which accounted for 35 minutes of operational errors since January 2003. The total number of LHD occurrences and duration were considered to be relatively small.

Safety oversight for the RVSM implementation in the Bay of Bengal airspace

4.24 The MAAR report summarized the results of the safety assessment for the Bay of Bengal RVSM implementation. **Table 4-1** below provides the draft estimates of technical, operational, and total risks calculated for the Bay of Bengal RVSM implementation (some data, including the data for Yangon and Jakarta FIRs was not available, and therefore was not able to be taken into account).

Source of Risk	Lower Bound Risk Estimation	TLS	Remarks
Technical Risk	5.59×10^{-10}	2.5×10^{-9}	Below Technical TLS
Operational Risk	1.43×10^{-9}	-	-
Total Risk	1.99×10^{-9}	5.0×10^{-9}	Below Overall TLS

Table 4-1: Draft Risk Estimates for the RVSM Implementation in BOB

4.25 Based on the collision risk estimates, the technical risk for the RVSM implementation in the Bay of Bengal was 5.59×10^{-10} fatal accidents per flight hour. The total risk attributed to all causes was 1.99×10^{-9}. Therefore, the 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 due to the loss of a correctly established vertical separation standard of 1,000 ft, and to all causes, respectively.

4.26 MAAR advised the meeting that they would update the draft annual report and associated risk calculations on receipt of the missing traffic sample data and large height deviation reports.

Update on conducting an airspace safety review for RVSM implementation in the Western Pacific/South China Sea area

4.27 MAAR provided an update with regard to conducting an airspace safety review of RVSM implementation in the WPAC/SCS area. In accordance with the requirement of the RVSM/TF, a safety review was necessary to support the proposed changes to the RVSM flight level origination scheme under consideration for the WPAC/SCS airspace. The traffic data for use in the analysis was for the period 1 to 31 July 2004 and States had been requested by the RVSM/TF to submit the data to MAAR. The meeting was informed by MAAR that of the 10 States responsible for 14 FIRs involved in the WPAC/SCS area, complete data had only been provided by 5 States covering 6 FIRs. In regard to LHD reports, 6 FIRs had no reports submitted. The meeting, in recognizing that this was a very poor response and that without the missing data the safety assessment could not be completed, stressed that follow-up action would be required to obtain the data.

Matters arising from the MAAR reports

4.28 The meeting thanked MAAR for its comprehensive and detailed report of RVSM operations in the Bay of Bengal area for the preceding year and the safety review carried out. The meeting was pleased to note that results of the risk calculations were well within the TLS. However, there were a number of disturbing issues that had been identified by MAAR that required urgent follow up:

a) missing traffic sample data;

b) missing large height deviation reports;

c) incomplete and non-reporting of State approvals registry data; and

d) incomplete information on follow-up monitoring of aircraft height-keeping performance in accordance with the minimum monitoring requirements.

4.29 The meeting was concerned that some States had failed to fulfill their obligations towards ICAO safety requirements for ongoing operation of RVSM. The periodic review and updating of the safety assessments for RVSM airspaces was an essential part of RVSM operations, along with the maintenance of the regional and global records of States' aircraft and operator RVSM approvals. The provision of monthly LHD reports (including "NIL reports" where applicable) was essential for determining operational errors that impact on RVSM safety. The absence or incompleteness of such data denigrates the integrity of the safety assessment results.

4.30 The meeting emphasized that the implementation and continued application of RVSM and other reduced separation minima were predicated on safety assessments being performed and updated, and the target level of safety being demonstrated as having been met. The documentation of aircraft results from the height monitoring programme was a key safety activity that enabled any adverse trends in the accuracy of aircraft altimetry system performance to be detected and remedial action taken. It was recalled that through the height monitoring programme of the North Atlantic and later verified by European results (both regions operate height monitoring units), an undesirable drift in the altimetry system error (ASE) had been detected. The ICAO Separation and Airspace Safety Panel (SASP) was examining this problem, which appeared to be most likely associated with drift characteristics of the pressure sensors within Air Data Computer or Air Data Modules. SASP had noted that there was no immediate concern for the safety of RVSM operations, since the aircraft were still within the required tolerances. SASP had agreed that the ASE drift issue justified the need for long-term monitoring.

4.31 The meeting recognized that this sort of problem should be made known to State safety authorities to reinforce the need for due diligence in their safety management programmes and to fully cooperate with the regional RVSM monitoring programme. The meeting agreed that those States who had not submitted the required data and information to MAAR as described above, be informed and requested to submit the data as a matter of priority. Accordingly, the meeting prepared a draft letter to be sent to States by the Regional Office.

4.32 The Secretariat informed the meeting that the 41st Conference of the Director Generals of Civil Aviation of the Asia and Pacific Region would be held in Hong Kong, China from 1-5 November 2004, and this would be an opportune time to bring these matters to their attention. The Secretariat agreed to submit an appropriate paper to the Conference.

Report of PARMO's RMA activities

4.33 The United States presented the quarterly report for Pacific airspace, prepared by the Pacific Approvals Registry and Monitoring Organization (PARMO). As the RMA for Pacific airspace, PARMO was responsible for circulating regular reports of all reported height-keeping deviations, together with the necessary information to relate the estimated system risk to the TLS. To fulfill this responsibility, the PARMO distributes this report on a quarterly basis. The report compares actual performance to safety goals related to the continued application of RVSM in the Pacific airspace.

4.34 This quarterly report contained a summary of LHD reports received by the PARMO for the most recent 12-month period of July 2003 – June 2004. There were a total of eleven reported large height deviations that occurred during this 12-month period inside Pacific airspace which was restricted to aircraft operating using RVSM. It was noted that the large height deviation reporting had improved since the previous safety monitoring reports.

4.35 The LHD reports were separated by categories based on the details provided for each deviation. There were three categories created for this report:

a) risk-bearing large height deviations not involving whole numbers of flight levels;

- 2 reports were received: 1 due to turbulence or another weather-related cause; the other was a TCAS resolution advisory;

b) risk-bearing large height deviations involving whole numbers of flight levels; and

- 9 reports were received: 5 errors reported due to ATC-unit-to-ATC-unit transition message; 2 errors reported due to an aircraft climb without ATC clearance; and 1 reported error caused by no transfer received from ATC transitioning unit;

c) large height deviations occurring outside of restricted RVSM airspace in the Pacific

- 2 reports were received; 1 below the RVSM airspace (below FL290); and the other in domestic airspace. These did not affect the risk estimate for Pacific airspace but were presented in the report for completeness.

4.36 The meeting appreciated receiving PARMO's quarterly report. It was noted that PARMO had requested that ATS providers should continue to forward the reports of large height deviations of 300 ft or more to the PARMO on a monthly basis. A 'NIL report' (where applicable) was as valuable as a report containing actual incidents. Therefore, if zero events occur during a calendar month, it was still necessary to submit a 'NIL report' to the PARMO. The email address for the PARMO is: aparmo@faa.gov. The website address for the PARMO is http://www.tc.faa.gov/acb300/PARMO/.

4.37 The meeting was disappointed to learn that some States in the Pacific Region were also not fulfilling their obligations in this regard. In light of the discussion above concerning the lack of reports from States, the United States advised the meeting that PARMO had also experienced this difficulty. The meeting requested that the Pacific States concerned also be sent the letter from the Regional Office referred to in paragraph 4.31.

4.38 Following the review of the PARMO and MAAR reports, Australia noted that the classification of large height deviation reports being used by Airservices Australia did not match the classification used by both PARMO and MAAR. In this regard, Airservices Australia would be requested to review this matter and coordinate with the other RMAs to resolve this situation.

Data on weather deviation requests in the South Pacific

4.39 Australia provided the meeting with information on statistics on weather deviation requests and ATC responses collated in the Pacific by the relevant FIT and generally reported back to IPACG or ISPACG. It had been recognized that delays or inability to obtain an ATC authorized weather deviation have been one reason cited where flight crews may need to deviate from an authorized track in a contingency situation. Such deviations should be taken into account when safety assessments were prepared for the implementation of reduced separation in airspace systems.

4.40 The data under consideration covered the period January 2002 to July 2004 and related to information obtained from two air traffic services units in the South Pacific. The files included the number of requests, the number of Unable/Standby responses (and their percentage of the total requests), and the fastest/average response times in seconds.

4.41 The meeting noted the information provided.

South Pacific data link reporting performance data

4.42 Australia presented information regarding data link operations in the South Pacific and specifically reporting performance data related to ADS and CPDLC messaging. The meeting was advised that this data had been collated by the FIT as part of its reporting requirement to ISPACG. The meeting noted the information provided and the fact that the performance data for both uplink and downlink messaging continued to exceed the target levels.

Agenda Item 5: Review regional and global airspace planning and implementation developments and provision of airspace safety monitoring services

CNS/ATM implementation delays

5.1 The meeting was advised that APANPIRG/15 (August 2004) had noted that the planning and implementation of some elements of the "Asia/Pacific Regional Plan for the New CNS/ATM Systems" such as the ADS, ATN, AIDC, automated AIS systems, GNSS and ADS-B were progressing slowly. States were urged to give appropriate priority to progressing their implementation planning, in particular in the area of data link communications and ATM automated systems. APANPIRG/15 also noted that the Air Navigation Commission, during its ongoing review of global and regional developments in the modernisation of air navigation system, had noted that although good progress had been made with implementation of certain elements of CNS/ATM systems, the overall pace of implementation was understandably slower than originally expected. The Commission requested the Secretary General to invite PIRGs and States to enhance their activities in the area of planning and implementation of CNS/ATM systems.

ADS/CPDLC Operational Trial - Bay of Bengal

5.2 The meeting was updated regarding the progress of the ADS/CPDLC operational trial established by the FIT-BOB, which commenced in the Bay of Bengal area on 19 February 2004. The States participating in the trial were India, Indonesia and Thailand. The preparedness and level of equipage of other States responsible for the airspace over the Bay of Bengal area and adjacent oceanic

airspace, i.e. Malaysia, Myanmar and Sri Lanka were reviewed in order to assess their ability to join the operational trial.

5.3 The meeting noted that BBACG/13 (September 2003) had recognized that the establishment of a CRA was critical to enabling States to implement operational ADS and CPDLC systems. The BBACG/13 meeting also recognized that, as the CRA contributed to the safety requirements for implementation and ongoing operation of ADS and CPDLC services by the ATS providers, the setting up and operation of the CRA for the Bay of Bengal area was the responsibility of the States participating in the FIT-BOB. The meeting was advised that satisfactory arrangements regarding the establishment of the BOB CRA had been finalised between IATA and Boeing and that the CRA would be able to commence work related to the Bay of Bengal operational trial from October 2004.

Expansion of the operational trial in the Indian Ocean area

5.4 The Secretariat considered that there were a number of advantages in expanding the data link implementation plan and the operational trial to include the greater Indian Ocean area, and bring the oversight of these activities under one ATS Coordination Group. This would necessarily involve coordination with Australia, island States in the Indian Ocean and East African States, in addition to the member States of the BBACG. A greater level of standardisation would be achieved and operational implementations would be more readily coordinated in order to avoid patchy implementation. The ADS/CPDLC experience of Australia and the BBACG States involved in the current operational trial would be available to the group. Boeing had indicated that they expected to be in a position to expand the services provided by the BOB CRA to cover the entire Indian Ocean if required. The meeting agreed that this would result in an effective use of resources and was supported. In addition, RASMAG already held responsibilities for the entire Asia/Pacific Region.

Establishment of FANS Implementation Team South-East Asia (FIT-SEA)

5.5 The meeting recalled that at the APANPIRG/14 meeting (August 2004), it was noted (paragraph 2.1.104 of the report) that in recognition of the effectiveness of the FANS Interoperability Teams (FIT) operating in the Pacific Region under ISPACG and IPACG (PAC-FIT) and the FANS Implementation Team operating in the Bay of Bengal area (FIT-BOB), a similar mechanism should be established to progress FANS issues in the South-East Asia area.

5.6 FIT-SEA/1 agreed that in order to establish integrated ADS and CPDLC services for the provision of ATS services in the South-East Asia area, it would be necessary to establish a FIT-SEA following the FIT-BOB model and adopting the FIT-BOB documentation as appropriate. In this regard, FIT-SEA/1 agreed to establish the implementation plan, identify the airspace where data link services would be implemented and establish an operational trial.

5.7 States responsible for the non-radar airspace over the South China Sea (SCS) provided information on their preparedness to implement ADS and CPDLC. Only Singapore had implemented data link services and had been operating ADS and CPDLC since 1997 for ATC in the Singapore FIR.

5.8 FIT-SEA/1 recognized that as a result of the low level of equipage amongst SCS States, there would be some delay in commencing an integrated operational trial of ADS/CPDLC in the SCS area, probably not until 2006/2007. In light of the delays expected, the meeting agreed that the development of the main work programme would be deferred until the next meeting of FIT-SEA, at which time further information was expected to be available on the status of the facility upgrades of a number of States which were currently at an early stage, and the consequent preparedness of States to commence a trial.

Establishment of a Central Reporting Agency (CRA)

5.9 FIT-SEA/1 noted the importance of establishing a CRA to enable States to monitor operational ADS and CPDLC systems. In this regard, the CRA performs the essential technical analysis of the performance of these systems and undertakes the investigation of system failures and other technical malfunctions. This was essential to trace the cause of problems whether in the aircraft, network or ground systems, and to initiate remedial action by the responsible parties.

5.10 Because there would be some delay in commencing an operational trial in the SCS area (2006/2007), the selection of a CRA could be delayed until closer to the commencement of the trial. It was agreed this would be deferred until the FIT-SEA/2 meeting, at which time experience would have been gained with the FIT-BOB CRA.

5.11 Japan advised the meeting of the offer presented by the JCAB CRA at the FIT-SEA/1 meeting to undertake the role of CRA for the South China Sea as an extension to its existing activities. The meeting was reminded that ATS data link monitoring in the North and Central Pacific airspace was being performed jointly by the CRAs of the FAA and JCAB, under the direction of the IPACG FIT. For the FIT-SEA activities, the JCAB CRA proposed to work together with Boeing by forming a joint CRA. The meeting noted that the FAA and JCAB CRAs have undertaken successful joint activity for the IPACG FIT for the past three years.

Establishment of operational trial

5.12 FIT-SEA/1 was updated by the Philippines, Singapore and Viet Nam who were responsible for the FIRs where ADS and CPDLC could be implemented for the non-radar oceanic airspace. The Philippines had developed a master plan for implementation of CNS/ATM systems in line with the Asia/Pacific Regional Plan and it was expected that the project would be completed in 2007, and they would be in a position to participate in the operational trial for the SCS. Singapore had introduced ADS/CPDLC services in 1997 on a limited basis over the oceanic part of the Singapore FIR in the South China Sea area using a standalone workstation. In February 1999, the ADS/CPDLC system was integrated into their ATC system, LORADS II and the services extended to 24 hours from October 1999. Viet Nam would provide ADS/CPDLC systems under their new CNS/ATM Systems Transition and Implementation Plan. The radar and data link systems would be integrated and was expected to be completed in 2006, at which time Viet Nam would be able to participate in the ADS/CPDLC operational trial for the SCS area

5.13 FIT-SEA/1 noted that only Singapore was presently able to provide ADS/CPDLC services for the oceanic non-radar airspace of the Singapore FIR. The other airspaces involved were within the Ho Chi Minh and Manila FIRs. In this regard, the South China Sea area ADS/CPDLC operational trial would be carried out by the Philippines, Singapore and Viet Nam. Indonesia would also participate in this trial for the eastern part of the Jakarta FIR (they were also participating in the Bay of Bengal trial). Accordingly, a full operational trial should be possible by 2007.

Data link monitoring requirements

5.14 FIT-SEA/1 reviewed the data link monitoring requirements that would need to be established for the commencement of an ADS and CPDLC operational trial and ongoing operations. In this regard, airspace safety monitoring programmes require monitoring for implementation and ongoing application of reduced separation minima such as reduced vertical separation, reduced horizontal separation using RNP, and separation based on ADS and CPDLC. The ATS data link applications support the reduction in longitudinal separation, e.g. 30 and 50 NM using ADS and CPDLC, whereby distance-based separation replaces time-based separation. Because of the integrated nature of modern systems and the degree of interaction among the components, end-to-end system monitoring was required.

5.15 FIT-SEA/1noted that the guidance material being developed by RASMAG for end-to end safety and performance monitoring of ATS data link systems in the Asia/Pacific Region would be of assistance to the FIT-SEA in order for the CRA to set up and operate the data link monitoring services for the South-East Asia area.

5.16 The meeting noted the report of the FIT-SEA/1 meeting and noted the progress to implement data link services in the South-East Asia Area. It was also noted that an operational trial could not commence until the Philippines and Viet Nam had upgraded their ATM systems to include provision of ADS and CPDLC.

Update on the FANS Interoperability Team activities

5.17 The United States and Japan informed the meeting of the main subjects considered by the Eighth Meeting of the FANS Interoperability Team (FIT/8) held in Tokyo, Japan, on 7-8 June 2004, which was followed by the Twenty-first Meeting of the Informal Pacific Air Traffic Control (ATC) Coordinating Group (IPACG/21). The following matters were considered by the FIT/8 meeting:

a) 19 requests for change to the FANS-1/A Operations Manual that had been accepted by the ISPACG FIT/11 meeting;

b) Reports of the FAA and JCAB CRA activities;

The FAA CRA introduced the following problem reports:

- B747-400 FMC ignores uplinks for one function (PR 377)
- B777 position report estimate incorrect after waypoint sequence (PR 446)
- KAKES black hole investigation (PR 447)
- B777 flight number synchronization problem (PR 449)
- Multiple reports from B777 (PR450)
- Ground system used wrong format for B777 (PR 451)
- Airplane transfers OK, but ATSU does not recognize transfer (PR 452)
- Unusual free text with vertical clearance request (PR 454)

The JCAB CRA introduced the following problem reports:

- Unreasonable message sent from a data link service provider (PR10191)
- ADS report error (PR10193)
- Data delay (PR10198, PR10201, PR10203, PR10207, PR10217)
- Inappropriate logon and CPDLC position report (PR10205)
- Abnormal display of flight path on ATC screen (PR10212, PR10215)
- Illegible CPDLC freetext (PR10216)
- Multiple reception of same CPDLC downlink messages (PR10222)

c) JCAB expected the MTSAT-1R launch in early 2005, and it would become operational 7 to 9 months after the launch;

d) The Office of Aeronautical Satellite Systems, JCAB presented information on the MTSAT system and discussed the following:

- Handover between MTSAT and INMARSAT during flight
- GES and satellite redundancy
- SATCOM ORT Editor
- Distribution of SATCOM message to each end-user

e) Airbus presented information regarding satellite channel data format;

f) JCAB CRA presented an analysis of the causes of data link connection failures; and

g) JCAB informed the meeting of the report of the SEACG/11 meeting.

Applicability of ADS Reports as the Primary Means of Surveillance

5.18 The JCAB CRA reported to the meeting on a feasibility study they carried out, in which it was assumed ADS waypoint reports would be applied as the primary means of surveillance and CPDLC position reports were omitted. In this environment, the pilot's and controller's workload, network load and operational cost were expected to be reduced because of fewer numbers of CPDLC position reports. To validate the **a**pplicability of ADS reports as the primary means of surveillance, the analyses were carried out with 987 ADS reports and CPDLC messages collected at Tokyo ACC. Of these 374 CPDLC messages and 600 ADS reports were valid, and it was estimated that 276 each for ADS and CPDLC (92.3%) were successfully reported at the same compulsory reporting points and 22 ADS reports (7.7%) were missing for the required reporting points.

5.19 The accuracy of ADS waypoint reports were examined in longitude and latitude comparing this with the published reporting points. As a result, 97% of ADS waypoint reports were within the difference of one minute less in longitude and latitude. One minute difference in longitude was almost equivalent to 0.6 NM near the sampled data. Also, 99% of ADS waypoint reports were within the difference of 2 minutes in latitude or 3 minutes in longitude, which amounted to approximately 2 NM in distance. It was determined that this value was within the acceptable tolerance for safety in the oceanic ATC operational environment.

5.20 JCAB CRA also reported that as a result of analysis of 26,648 CPDLC downlink messages, the 36 percent of these messages that comprised position report messages would be redundant if ADS reporting was used as the primary means of surveillance. As such, CPDLC position reports were no longer required.

5.21 The meeting noted the study and the promising results that could lead to making use of ADS reports as the primary means of surveillance for the Tokyo FIR for those aircraft operating with ADS.

Agenda Item 6: Airspace safety monitoring documentation and regional guidance material

Reporting requirements

6.1 The meeting recalled that one of the duties of the RMAs was to regularly circulate reports reviewing RVSM related performance in affected FIRs relative to the established safety goals. Based on this performance, estimates of technical and overall risk would be calculated and then compared with the RVSM safety goal, the relevant target level of safety (TLS).

6.2 The RASMAG/1 meeting had agreed that RMAs should provide quarterly reports covering traffic sampling and operational errors, with an annual assessment report of the achieved level of safety and results of monitoring activity. The quarterly reporting schedule was in line with what was currently undertaken by PARMO and would be adopted by MAAR. Reporting for organizations involved in monitoring of reduced horizontal separation was agreed to be on a six monthly basis. RASMAG/1 had also reviewed the reporting procedures adopted by the various groups in the region, and agreed that all reports by the authorized groups related to safety management activities carried out for the international airspace of the Asia/Pacific Region should be made available to the RASMAG. RASMAG would review the reports and present a consolidated annual report to APANPIRG on the state of the safety of the international airspace in the region.

6.3 MAAR updated the meeting in this regard, advising that they were undertaking regular reporting to the RVSM/TF. As the RVSM/TF was active in the Asia region and therefore meeting a number of times each year, MAAR was regularly preparing RVSM safety monitoring reports and therefore considered that the need for additional quarterly reporting was redundant. MAAR acknowledged that the FIRs under PARMO jurisdiction would have different reporting needs as, in many cases, the concerned FIRs were continuing application of RVSM, and no longer had strong involvement with the RVSM/TF. In the case of the proposed implementation of RVSM in the domestic airspace of the Tokyo and Naha FIRs and Incheon FIR scheduled later in 2005, although these FIRs were under the jurisdiction of PARMO, as PARMO did not have the capability to assist as a result of their commitment to the US domestic RVSM implementation scheduled for 20 January 2005, PARMO had agreed that MAAR should conduct the safety assessment and monitoring to support this implementation on behalf of PARMO.

6.4 As a result, the meeting agreed that a reporting period of 6 months was appropriate for the medium term and that the reporting dates be adjusted in order to ensure that RASMAG was able to meet its requirement to provide an annual report to APANPIRG. In this regard, the meeting agreed that as the month of December routinely experienced high traffic levels, this should be adopted as the standard sample period for traffic sample data collection throughout the MAAR, PARMO and AsAR areas of responsibility, commencing from December 2005. Traffic sample data collected in December would be submitted to the RMAs by the end of January, allowing analysis and report preparation by the RMAs in order to update RASMAG in April/May and allow time for RASMAG to prepare an update for APANPIRG in August/September each year.

6.5 The meeting recognized that although there was currently no SMA in the Asia Region undertaking horizontal safety monitoring and assessment, this would occur in the foreseeable future. The United States advised the meeting that the FAA Technical Center was developing procedures to examine lateral navigational performance of aircraft using radar data, with application to the start or end of oceanic routes where 50NM lateral separation for RNP-10 approved aircraft was applied in the Oakland FIR. The intention would be to eventually expand the area in which navigational performance is evaluated to all areas of Pacific oceanic airspace where 50NM lateral separation for RNP-10 approved aircraft is applied. In order to minimize the impact on States of the need to collect traffic sample data, the meeting considered that efforts should be made to align the arrangements for the collection of horizontal traffic sample data information with the RVSM data collection, resulting in all required data being collected simultaneously

during the December sampling. In addition, the meeting agreed that annual reporting of RNP safety performance would provide suitable safety monitoring.

RVSM Minimum Monitoring Requirements

6.6 The meeting was updated by the Chairperson on the status of the RMA Handbook which has been completed by ICAO and agreed to by the approved global RMAs. It was expected to be published in the first quarter of 2005. The RVSM minimum monitoring requirements (MMRs) recommend by ICAO were contained in the Handbook. In this regard, the meeting agreed that RMAs of the Asia/Pacific Region should adopt these MMRs as amended from time to time (**Appendix D** refers). The meeting was advised that there was a slight difference between the updated February 2004 MMRs currently used by PARMO and MAAR and the MMRs in the current version (August 2003) of the draft RMA Handbook. The meeting noted that the draft RMA Handbook requirements were being reviewed and any updating would be taken into account by all RMAs concerned.

Review of Proposed Changes to the WPAC/SCS RVSM FLOS

6.7 The meeting was informed of the outcome of the RVSM/TF/22 meeting (September 2004), which carried out a review of the different flight level orientation schemes (FLOS) operating in the WPAC/SCS, which used the modified single alternate FLOS and in adjacent airspaces where the single alternate FLOS was used. The establishment of the modified single alternate FLOS for the WPAC/SCS areas was agreed at the RVSM/TF/9 meeting (January 2001) for the implementation of RVSM on the revised ATS route structure for the South China Sea area. Under the modified single alternate FLOS the six parallel uni-directional routes (viz, L642, M771, N892, L625, N884 and M767) operate the EVEN flight levels, viz, FL320, FL340, FL360 and FL380. For the bi-directional crossing tracks, the level assignment uses the corresponding ODD eastbound levels (FL330, FL370 and FL410) and westbound levels (FL310, FL350 and FL390). The meeting noted that subsequently FL 400 was added to the levels on the parallel routes.

6.8 The modified single alternate FLOS provided for a high level of safety of operations with the crossing routes by using a combination of ODD flight levels, which were vertically separated from the parallel routes using EVEN levels. This arrangement was compatible at the time with the conventional flight level orientation scheme (CVSM) being used in adjacent non-RVSM airspaces. Transition areas were established to change between the flight level orientation schemes.

6.9 The RVSM/TF had recognized that subsequent to the implementation of RVSM in the Bay of Bengal area on 27 November 2003, some States had expressed concerns over the number of transitions that had to be carried out between the two FLOS. Further, with the planned implementation of RVSM in the Naha, Tokyo and Incheon FIRs in the second half of 2005, the transition activities would increase for some States.

6.10 The RVSM/TF/22 agreed to a proposed change to the FLOS with a reassigned flight level allocation scheme as follows;

a) Parallel routes, both ways:

FL310, FL320, FL350, FL360, FL390, FL400

b) Routes crossing the parallels:

Eastbound: FL290, FL330, FL370, FL410
Westbound: FL280, FL300, FL340, FL380

c) Routes crossing b):

Eastbound: FL310, FL350, FL390
Westbound: FL320, FL360, FL400

d) Other routes;

All flight levels in the RVSM flight level band subject to bilateral agreement between FIRs to avoid 'bunching effect'

6.11 It was agreed by RVSM/TF/22 that before any change was affected to the current flight level scheme, any replacement system would be required to demonstrate that it was equally safe and efficient. This would be subject to the full ICAO process of a safety analysis including calculations of the established TLS. The Task Force also agreed that sub-regional modeling and/or simulation exercises should be carried out to support any change to the WPAC/SCS FLOS.

6.12 RASMAG noted the issues being addressed by RVSM/TF to deal with the transition problems of operating the two different FLOS. In regard to the proposed changes to the FLOS, the meeting considered that this seemed to be a reasonable solution, however, the safety considerations would need to be adequately addressed. RASMAG also noted that the RVSM/TF had adopted a cautious approach to making any changes and to fully evaluate the impact on operations. This matter would be further reviewed at the next RVSM/TF and RASMAG meetings.

Draft Guidance Material for End-To-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region

6.13 The meeting reviewed the *Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region,* noting the development of the material that had occurred since the material was initially presented at RASMAG/1. The guidance material was intended to provide a set of working principles for ATS data link system performance monitoring that would be applied by all States implementing these systems, as well as providing detailed guidance on the requirements for establishing and operating a FANS-1/A Interoperability/Implementation Team (FIT) and Central Reporting Agency (CRA). It was intended that this guidance material would help promote a standardized approach for monitoring the performance of ATS data link systems within the Region.

6.14 In reviewing the material, it was evident that clarification of the terms FANS 1/A Interoperability Team and FANS 1/A Implementation Team would be necessary. The difference in terminology had arisen because the first Interoperability Teams had been constituted under the Informal Pacific and South Pacific ATS Coordination Groups, whereas the Implementation Teams had been constituted under the Bay of Bengal and South-East Asia ATS Coordination Groups. The meeting agreed that at some stage, the implementation activities undertaken by the Implementation Team ceased as the system came into mature operation and the Implementation Team would be dissolved, however there was a need for ongoing monitoring activities associated with an operational system and that these activities would be undertaken by the Interoperability Team. The meeting noted the implementation activities scheduled for the Bay of Bengal and South China Sea areas and agreed that the term Implementation Team was appropriate in this regard.

6.15 The meeting agreed that the draft guidance material would be further reviewed in order to address these concerns. The Regional Office would circulate the current draft of the guidance material to the FIT-BOB, FIT-SEA, IPACG and ISPACG forums to allow enhancements to be made based on the experience of these groups. The meeting was pleased to note the maturity of the guidance material and agreed that every effort should be made to finalize the material in time for consideration by RASMAG/3,

with a view to bringing the material to APANPIRG/16 for endorsement as regional guidance material. The draft guidance material is provided in **Appendix E.**

Agenda Item 7: Inter-regional coordination

7.1 The meeting had no matters for discussion under this agenda item but recognized that subjects for inter-regional coordination would need to be kept under review and brought to the meeting as appropriate.

Agenda Item 8: Any Other business

Implementation of 2 NM lateral offset right of centre line procedures

8.1 The Secretariat informed the meeting that ICAO had issued revised procedures for lateral offsets 2 NM right of centre line by State letter on 27 August 2004 (ref AN 13/11.6-04/85). Further, attention was drawn to APANPIRG/15 Conclusion 15/8 calling on States to adopt a coordinated approach to implementing the offset procedures throughout the Asia/Pacific Region simultaneously, and that the Regional Office should coordinate an implementation date coincident with an AIRAC date as soon as practicable.

8.2 In implementing these procedures, it was anticipated that there would be minimal charting changes required and that training requirements for ATS staff and flight crews would not be complex. Although some adjustments may be required to automated systems (e.g. ATS route conformance warning parameters), States and international organizations should be able to facilitate the early introduction of the 2 NM right offset procedures. IATA emphasized the importance for States to avoid an ad hoc implementation especially over contiguous airspaces, which could lead to confusion for operators

8.3 The BBACG/15 meeting had reviewed this matter and agreed that AIRAC date 25 November 2004 should be the date for implementation. The RVSM/TF/22 meeting considered that AIRAC date 20 January 2005 would be preferred as this would allow time for States to prepare and issue AIP Amendments. Accordingly, the Regional Office would undertake coordination with States for implementation on 20 January 2005.

8.4 A draft AIP Amendment for implementation of the 2 NM lateral offset procedures is included as **Appendix F.** In regard to the implementation date, the meeting agreed that 20 January 2005 was reasonable and would allow sufficient time for States to complete necessary formalities.

Language Proficiency

8.5 The meeting was informed of ICAO provisions on language proficiency in Annex 1 – *Personnel Licensing,* Annex 6 – *Operation of Aircraft,* Annex 10 – *Aeronautical Telecommunications* and Annex 11 – *Air Traffic Services* adopted in March 2003. The language proficiency requirements clarified and extended existing provisions.

8.6 The increasing concern over the number of airline accidents in which investigators determined that language problems had played a contributory role resulted in new ICAO requirements for controllers and pilots involved in international operations to demonstrate a minimum level of English language proficiency. The ICAO language requirements focus on the assessment of communicative proficiency, that is, an individual's speaking and listening skills. In addition, the proficiency requirements apply to native or non-native speakers alike, in order to identify other issues (e.g. any speech impediment) that would affect an individual's capacity to operate safely.

8.7 Amendment 164 to Annex 1 included an Attachment specifying the criteria for the requirements and assessment of language proficiency. This rating scale describes 6 levels of proficiency and would be used to guide the assessment of an individual's language ability. The extract from the Attachment relating to the Level 4 criteria required for pilot and controller proficiency is reproduced in **Appendix G.**

8.8 The meeting was informed of ICAO's worldwide educational and awareness campaign to introduce ICAO language proficiency requirements and to provide practical information to facilitate implementation of the new SARPs. A three-day symposium on the new ICAO language proficiency requirements was held at ICAO Headquarters, Montreal, from 1 to 3 September 2004. The symposium had noted the importance of standardized voice phraseologies and identified the need to harmonize the CPDLC message set with the voice phraseologies. During the Symposium, ICAO and IATA agreed to work closely together with suitable private providers of English language training/assessment in order to develop standardized materials to assist the implementation of the language proficiency SARPs.

Asia Pacific Regional Seminar - Tokyo

8.9 The first ICAO language proficiency regional seminar would be held in the Asia/Pacific Region at Tokyo, Japan on 8 - 10 December 2004, hosted by the Japanese Civil Aviation Bureau. Participants would receive practical advice on how to comply with the ICAO SARPs concerning language proficiency. Details on this seminar had been recently provided to States by the Regional Office.

8.10 The meeting urged States to take full advantage of the regional seminar, as it would be of considerable benefit to assist States to understand and apply the language proficiency requirements.

Manual on the Implementation of the ICAO Language Proficiency Requirements

8.11 The *Manual on the Implementation of the ICAO Language Proficiency Requirements* (Doc 9835-AN/453), which addresses the various training and evaluation issues related to the implementation of ICAO language proficiency Standards was published in September 2004.

Agenda Item 9: Date and venue of RASMAG/3 meeting

9.1 The meeting in considering the date for the RASMAG/3 meeting, agreed that this should be after the meetings of the FIT-SEA/2, FIT-BOB/5 and RVSM/TF/26 (FLOS review), which would be held before the second week of May 2005. As the schedule for the other meetings already had been tentatively planned, the Secretariat would have to review the Regional Office meeting schedule for the first half of next year, and it would not be possible to set a date for RASMAG/3 at this meeting. Members would be advised of suitable dates in due course.

10. **Closing of the meeting**

10.1 The Chairman thanked the members for their active participation and the good results achieved, that had effectively progressed the work programme. Positive outcomes had been achieved that better defined the role of RASMAG and there was a clearer understanding of the work to be accomplished. Further, it was evident from discussions that RASMAG had an important part to play in providing States with information on how to set up and manage airspace safety management activities involving airspace assessments and performance monitoring. The establishment of a core team and seminar programme should greatly facilitate this process. The Chairman again thanked IATA for their generous offer to assist with travel arrangements for the RASMAG experts in order to facilitate the conduct of the seminar programme.

10.2 The Chairman expressed his appreciation for the support provided to RASMAG by the States and international organizations concerned. For RASMAG to continue to progress its work in an effective and timely manner, he requested participants to bring to the attention of their Administrations the importance of making available representatives who had appropriate expertise, especially in ATS operations and safety management, and would be able to attend RASMAG meetings on a regular ongoing basis.

LIST OF PARTICIPANTS

STATE/NAME	DESIGNATION/ADDRESS	TEL/FAX/E-MAIL
AUSTRALIA		
Mr. Robert Butcher	Safety Manager Directorate of Safety and Environment Assurance Airservices Australia GPO Box 367 Canberra ACT 2601 Australia	Tel: 61 2 6268 4845 Fax: 61 2 6268 5695 E-mail: robert.butcher@airservicesaustralia.com
HONG KONG, CHINA		
Mr. Joseph Yan-chi Cheuk	Senior Safety and Quality Officer (Enroute) Civil Aviation Department 4/F, Air Traffic Control Complex 1 Control Tower Road Hong Kong International Airport Lantau Hong Kong, China	Tel: 852-2910 6448 Fax: 852-2910 0186 E-mail: jyccheuk@cad.gov.hk
INDIA		
Mr. S.K. Saha	General Manager (AIS) Airports Authority of India Rajiv Gandhi Bhavan Safdarjung Airport New Delhi 110003 India	Tel: 91-11-24615508 Fax: 91-11-24615508 E-mail: gmais@aai.aero
Mr. N.S. Dagar	Asst. GM (Aviation Safety) Airports Authority of India Rajiv Gandhi Bhavan Safdarjung Airport New Delhi 110003 India	Tel: 91-11-2463 2950 ext 2623 Fax: 91-11-2462 1504 E-mail: gmais@aai.aero
JAPAN		
Mr. Udaka Keizo	Special Assistant to the Director ATS System Planning Division ATS Department Civil Aviation Bureau Ministry of Land, Infrastructure and Transport 2-1-3 Kasumigaseki, Chiyoda-ku Tokyo 100 8918 Japan	Tel: 81-3-5253 8739 Fax: 81-3-5253 1663 E-mail: udaka-k2s5@mlit.go.jp
Mr. Yoshiro Nakatsuji	Director Air Traffic Control Association K-1, 1-6-6 Haneda Airport Ota-ku Tokyo 144-0041 Japan	Tel: 81-3-3747 1685 Fax: 81-3-3747 0856 E-mail: naka@atcaj.or.jp

STATE/NAME	DESIGNATION/ADDRESS	TEL/FAX/E-MAIL
NEW ZEALAND		
Mr. Toby Farmer	Aeronautical Services Officer Civil Aviation Authority of New Zealand P.O. Box 31 441 Lower Hutt New Zealand	Tel: 64-4-560 9583 Fax: 64 4 569 2024 E-mail: farmert@caa.govt.nz
SINGAPORE		
Mr. Rosly Saad	Chief, SATCC Operations Division Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: (65) 6541 2685 Fax: (65) 6545 6252 E-mail: Rosly_Saad@caas.gov.sg
Mr. Michael Shee Cheng Wah	Air Traffic Control Officer Operations Division Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: (65) 6541 2686 Fax: (65) 6545 6252 E-mail : michaelscw@yahoo.com
THAILAND		
Mr. Choosit Kuptaviwat	Director, Air Traffic Services Engineering Planning and Standards Department Aeronautical Radio of Thailand Ltd 102 Soi Ngarmduplee Tungmahamek, Sathorn Bangkok 10120, Thailand	Tel: +66-2-2859457 Fax: +66-2-2859538 E-mail: choosit.ku@aerothai.co.th
Mr. Polawat Chootai	Air Traffic Control Manager Air Traffic Service Operations Bureau AEROTHAI 102 Ngamduplee Thungmahamek Bangkok 10120, Thailand	Tel: +66-2-287 8211 Mobile: +66-6-526 6865 Fax: +66-2-287 8155 E-mail: polawat.ch@aerothai.co.th
Dr. Paisit Herabat	Senior Systems Engineer ATS Planning Department AEROTHAI 102 Ngamduplee Thungmahamek Bangkok 10120, Thailand	Tel: +66-2-285 9191 Fax: +66-2-285 9716 E-mail: paisit@aerothai.co.th
Mr. Nuttakajorn Yanpirat	System Engineer Planning and Project Department AEROTHAI 102 Ngamduplee Thungmahamek Bangkok 10120, Thailand	Tel: +66-2-287 8311 Fax: +66-2-285 9486 E-mail: nuttakajorn.ya@aerothai.co.th

STATE/NAME	DESIGNATION/ADDRESS	TEL/FAX/E-MAIL
Mr. Koson Loyliw	Engineering Manager AEROTHAI 102 Ngamduplee Thungmahamek Bangkok 10120, Thailand	Tel: +66-2-287 3531-41 E-mail: koson@aerothai.co.th
Mr. Tevun Tunthagadh	Chief Flight Operations Officer Flight Operations Control Center Thai Airways International Public Company Limited 4/F Central Block Bangkok International Airport Bangkok, Thailand	Tel: +66-2-535 2975 E-mail: tevun.t@thaiairways.co.th
UNITED STATES		
Ms. Leslie McCormick	Senior International Program Officer Air Traffic Operations Planning - International Federal Aviation Administration 800 Independence Ave SW Washington, D.C. 20591 U.S.A.	Tel: 1-202-385 8082 Fax: 1-208-246 6014 E-mail: leslie.mccormick@faa.gov
IATA		
Mr. Neil Jonasson	Assistant Director – Safety, Operations & Infrastructure – Asia/Pacific International Air Transport Association 77 Robinson Road #05-00 SIA Building Singapore 068896	Tel: 65-6239 7262 Fax: 65-6536 6267 E-mail: jonassonne@iata.org
IFATCA		
Mr. Koji Kato	IFATCA Representative 3-4-12 Fujimi-cho Higashimurayama-shi Tokyo Japan	Tel: +81-423 96 7506 Fax: +81-423 96 7506 E-mail : koji358@naver.co.jp
ICAO		
Mr. David J. Moores	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX E-mail: dmoores@bangkok.icao.int
Mr. Andrew Tiede	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX E-mail: atiede@bangkok.icao.int

---

LIST OF INFORMATION AND WORKING PAPERS

WORKING PAPERS

WP No.	Date	Agenda Item	Presented by	Subject
1	4/10/04	1	Secretariat	Provisional Agenda
2	4/10/04	3	United States	Contracting for Regional Airspace Safety Monitoring Agencies
3	4/10/04	5	Secretariat	Review of the Report on the Eighth Meeting of FANS Interoperability Team (FIT/8) Informal Pacific ATC Coordinating Group
4	4/10/04	8	Secretariat	Implementation of 2NM Lateral Offset Procedures in the Non-Radar Oceanic Airspace of the ASIA/PAC Region
5	4/10/04	5	Secretariat	Summary Report of the FIT-SEA/1 Meeting (Bangkok, Thailand, 24-28 May 2004)
6	4/10/04	5	Secretariat	Update of Progress on the Data Link Operational Trial for the Bay of Bengal area as reported by the Fourth Meeting of the FANS Implementation Team for the Bay of Bengal area
7	4/10/04	5	Secretariat	Review of the Outcomes of the RVSM/TF/22 on the Operation of Different RVSM Flight Level Orientation Schemes in the Asia/Pacific Region
8	4/10/04	5	Secretariat	Outcomes of APANPIRG/15 Review of the Report of the RASMAG/1 Meeting
9	4/10/04	2	Secretariat	RASMAG Terms of Reference and Task List
10	4/10/04	5	Japan	Validation of Applicability of ADS Report to Surveillance
11	4/10/04	5	Japan	Reduction of Workload in CPDLC Operation
12	4/10/04	6	New Zealand	Draft Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region
13	4/10/04	4	Australia	Report of RMA Activities by Airservices Australia with respect to RVSM
14	5/10/04	4	MAAR	Summary Of The Airspace Safety Review For The RVSM Implementation In Asia Region – Bay Of Bengal Airspace
15	5/10/04	4	MAAR	Update of the Airspace Safety Review for the RVSM Implementation in Asia Region – Western Pacific/South China Sea Airspace

INFORMATION PAPERS

IP No.	Date	Agenda Item	Presented by	Subject
1	4/10/04	-	Secretariat	List of Information and Working Papers
2	4/10/04	5	Secretariat	Update on Equipage by States for implementation of Data Link Services in the Indian Ocean Area
3	4/10/04	8	Secretariat	Language Proficiency
4	4/10/04	6	United States	Quarterly Safety Monitoring documentation and regional guidance material
5	4/10/04	4	Australia	Data On Weather Deviation Requests In The South Pacific
6	5/10/06	4	Australia	South Pacific Data Link Performance Data January – July 2004
7	6/10/06	8	Japan	Offer of Japan CRA to provide for the Central Reporting Agency Activity

…….

RASMAG/2 — WORK PLAN

(last updated 8 October, 2004)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
1	~~Amend the Terms of Reference for RASMAG~~	~~1/10/04~~	~~Secretariat~~	~~Completed~~	~~APANPIRG/15 agreed amendment to TOR~~
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	Some reports received by RO, RASMAG/2 WP/3 refers.
~~3~~	Review draft guidance material for End-to-End datalink systems performance monitoring.	RASMAG/3	New Zealand (T. Farmer), All members, Secretariat	Open	Preliminary update reviewed by RASMAG/2 - RASMAG/2 WP/12 refers..
4	Facilitate the required RVSM reporting to RASMAG from Australian RMA.	RASMAG/3	Australia (R. Butcher)	Open	APANPIRG/15 designated Australia as RMA & SMA for relevant airspaces – RASMAG/2 WP/8 refers.
5	Coordinate by letter to ALL RMAs, CRAs and FITs requesting safety assessment and monitoring reports as per RASMAG/1 report, para 9.13. ~~Draft to be circulated to members of RASMAG prior to despatch.~~	1/6/04	Secretariat	Open	
6	Coordinate by letter to ALL States in Asia/Pacific in accordance with RASMAG/1 report, para 8.7 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	Letter dated 28 January 2004 circulated to BOB States (ref T3/10.1.7 – AP006/04ATM)
7	Monitor outcome of FLOS discussions at next RVSM TF meeting and report back to RASMAG.	~~1/10/04~~ RASMAG/3	Secretariat	Open	RASMAG/2 updated regarding outcomes of RVSM/TF/22 - RASMAG/2 WP/7 refers. Further update to RASMAG/3 required.
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	

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
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/3	Secretariat, All members	Open	~~Superseded by Regional Seminar, Beijing 15-19 Nov 04~~ Workshop/Seminar will take place over 3 days prior to 2 day RASMAG/3 meeting
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	Secretariat, All members	Open	
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	Secretariat	Open	RASMAG/2 updated, further update due for RASMAG/3
12	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	
13	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	
14	Prepare and deliver on location safety workshop for States.	Confirm to Chairman by Feb 2005 re ability to deliver presentations	Secretariat Identified members, IATA	Open	Presentations to be sufficiently developed to be delivered to the Workshop/Seminar to be held in conjunction with RASMAG/3
15	Develop SMA Handbook.	Report progress to RASMAG/3	Chairman (R. Butcher),, United States (L. McCormick), Secretariat	Open	

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
16	Develop guidance on ADS/CPDLC ground system minimum equipment Specifications.	Report progress to RASMAG/3	New Zealand (T. Farmer), All members, Secretariat	Open	
17	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	
18	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	
19	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	
20	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	
21	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	Secretariat	Open	

PACIFIC RVSM MINIMUM MONITORING REQUIREMENTS:
AS OF: 4 FEBRUARY 2004

1. UPDATE OF MONITORING REQUIREMENTS CHART AND WEBSITE. As significant data is obtained, monitoring requirements for specific aircraft types may change. When the chart is updated, a letter will be distributed to States and operators. The updated chart will be posted on the PARMO website being maintained by the Federal Aviation Administration (FAA) on behalf of the International Civil Aviation Organization (ICAO) Asia-Pacific regional planning group. The website address is:

http://www.tc.faa.gov/acb300/parmo

2. INITIAL MONITORING. All Pacific operators that operate or intend to operate in airspace where RVSM is applied are required to participate in the RVSM monitoring program. The attached chart of monitoring requirements establishes requirements for initial monitoring associated with the RVSM approval process. In their application to the appropriate State authority for RVSM approval, operators must show a plan for meeting the applicable initial monitoring requirements.

3. AIRCRAFT STATUS FOR MONITORING. Aircraft engineering work that is required for the aircraft to receive RVSM airworthiness approval must be completed prior to the aircraft being monitored. Any exception to this rule will be coordinated with the State authority.

4. APPLICABILITY OF MONITORING FROM OTHER REGIONS. Monitoring data obtained in conjunction with RVSM monitoring programs from other regions can be used to meet Pacific monitoring requirements. The Pacific Approvals Registry and Monitoring Organization (PARMO), which is responsible for administering the Pacific monitoring program, has access to monitoring data from other regions and will coordinate with States and operators to inform them on the status of individual operator monitoring requirements.

5. MONITORING PRIOR TO THE ISSUE OF RVSM OPERATIONAL APPROVAL IS NOT A REQUIREMENT. Operators should submit monitoring plans to the responsible civil aviation authority that show how they intend to meet the requirements specified in the table below. Monitoring will be carried out in accordance with this table.

6. AIRCRAFT GROUPS NOT LISTED ON THE CHART. Contact the PARMO for clarification if an aircraft group is not listed on the Minimum Monitoring Requirements chart or for clarification of other monitoring related issues. An aircraft group not listed in the table below will probably be subject to Category 2 monitoring requirements.

7. TABLE OF MONITORING GROUPS. A table of monitoring groups is provided in the pages following the Minimum Monitoring Requirements Chart. The table shows the aircraft types and series that are grouped together for operator monitoring purposes.

8. TRAILING CONE DATA. Altimetry System Error estimations developed using Trailing Cone data collected during RVSM certification flights can be used to fulfill monitoring requirements. It must be documented, however, that aircraft RVSM systems were in the approved RVSM configuration for the flight.

9. MONITORING OF AIRFRAMES THAT ARE RVSM COMPLIANT ON DELIVERY. If an operator adds new RVSM compliant airframes of a type for which it already has RVSM operational approval and has completed monitoring requirements for the type in accordance with the attached chart, the new airframes are not required to be monitored. If an operator adds new RVSM compliant

airframes of an aircraft type for which it has NOT previously received RVSM operational approval, then the operator should complete monitoring in accordance with the attached chart.

10. FOLLOW-ON MONITORING. Monitoring is an on-going program that will continue after the RVSM approval process. A follow-on sampling program for additional operator aircraft will be coordinated by the Asia-Pacific RVSM Implementation Task Force.

PACIFIC APPROVALS REGISTRY AND MONITORING ORGANIZATION
EFFECTIVE AS OF: 4 FEBRUARY 2004

MONITORING IS REQUIRED IN ACCORDANCE WITH THIS CHART, HOWEVER, IT IS NOT REQUIRED TO BE COMPLETED PRIOR TO OPERATIONAL APPROVAL			
MONITORING CATEGORY		**AIRCRAFT TYPE**	**MINIMUM OPERATOR MONITORING FOR EACH AIRCRAFT GROUP**
1	Group approved and monitoring data indicates performance in accordance with RVSM standards. **Group Definition:** aircraft have been manufactured to a nominally identical design and build and for RVSM airworthiness approval fall into a group established in an RVSM certification document (e.g., Service Bulletin, Supplemental Type Certificate, Type Certificate Data Sheet).	[A30B, A306], [A312 (GE), A313(GE)], [A312 (PW), A313(PW)], A318, [A319, A320, A321], [A332, A333], [A342, A343], A344, A345, A346 B712, [B721, B722], [B733, B734, B735], B737(Cargo) [B736, B737/BBJ, B738/BBJ, B739], [B741, B742, B743], B74S, B744 (5" Probe), B744 (10" Probe), B752, B753, [B762, B763], B764, B772, B773 CL60(600/601), CL60(604), C560, [CRJ1, CRJ2], CRJ7, DC10, [E135, E145], F100, GLF4, GLF5, LJ60, L101, MD10, MD11, MD80 (All series), MD90	Two airframes from each fleet* of an operator to be monitored as soon as possible but **not later than 6 months after the issue of RVSM operational approval** * *Note. For the purposes of monitoring, aircraft within parenthesis* [ ] *may be considered as belonging to the same monitoring group. For example, an operator with six A332 and four A333 aircraft may monitor one A332 and one A333* ***or*** *two A332 aircraft* ***or*** *two A333 aircraft.*
2	Group approved but insufficient monitoring data collected to move aircraft to Monitoring Category 1. Group definition applies.	Other group aircraft other than those listed in Category 1 including: A124, ASTR, B703, B731, B732, BE20, BE40, C500, C25A, C25B, C525, C550**, C56X, C650, C750, CRJ9, [DC86, DC87], DC93, DC95, F2TH, [FA50 FA50EX], F70, [F900, F900EX], FA20, FA10, GLF2(II), GLF(IIB), GLF3, GALX, GLEX, H25B(700), H25B(800), H25C, IL62, IL76, IL86, IL96, J328, L29(2), L29(731), LJ31, [LJ35, LJ36], LJ45, LJ55, SBR1, T134, T154, T204, P180, PRM1,YK42	60% of airframes from each fleet of an operator (round up if fractional), as soon as possible but **not later than 6 months after the issue of RVSM operational approval.** (*Note: If 60 percent of the fleet yields a fractional number, round up to the next whole aircraft (e.g., for a fleet of 2 aircraft, 0.6 x 2 = 1.2; therefore, 2 aircraft must be monitored). ** Refer to aircraft group table for detail on C550 monitoring
3	Non-Group **Non-group Definition:** aircraft that do not fall under the group definition and for RVSM airworthiness approval are presented as an individual airframe.	Non-group approved aircraft	100% of aircraft shall be monitored as soon as possible but **not later than 6 months after the issue of RVSM operational approval.**

Monitoring Groups for Aircraft Certified under Group Approval Requirements

Monitoring Group	ICAO Desig-nator	A/C Type	A/C Series
A124	A124	AN-124 RUSLAN	ALL SERIES
A300	A306 A30B	A300 A300	600, 600F, 600R, 620, 620R, 620RF B2-100, B2-200, B4-100, B4-100F, B4-120, B4-200, B4-200F, B4-220, C4-200
A310-GE	A310	A310	200, 200F,300, 300F
A310-PW	A310	A310	220, 220F,320
A318	A318	A318	ALL SERIES
A320	A319 A320 A321	A319 A320 A321	CJ , 110, 130 110, 210, 230 110, 130, 210, 230
A330	A332, A333	A330	200, 220, 240, 300, 320, 340
A340	A342, A343,	A340	210, 310
A345	A345	A340	540
A346	A346	A340	640
A3ST	A3ST	A300	600R ST BELUGA
AN72	AN72	AN-74, AN-72	ALL SERIES
ASTR	ASTR	1125 ASTRA	ALL SERIES
ASTR-SPX	ASTR	ASTR SPX	ALL SERIES
AVRO	RJ1H, RJ70, RJ85	AVRO	RJ70, RJ85, RJ100
B712	B712	B717	200
B727	B721 B722	B727	100, 100C, 100F,100QF, 200, 200F
B732	B732	B737	200, 200C
B737 (Classic)	B733 B734 B735	B737	300, 400, 500
B737 New Generation (NG)	B736 B737 B738 B739	B737 B737 B737 B737	600 700, 700BBJ 800 900
B737 (Cargo)	B737	B737	700C
B747Classic (CL)	B741 B742 B743	B747	100, 100B, 100F, 200B, 200C, 200F, 200SF, 300
B74S	B74S	B747	SR, SP
B744-5	B744	B747	400, 400D, 400F (With 5 inch Probes)

Monitoring Group	ICAO Desig-nator	A/C Type	A/C Series
B744-10	B744	B747	400, 400D, 400F (With 10 inch Probes)
B752	B752	B757	200, 200PF
B753	B753	B757	300
B767	B762 B763	B767	200, 200EM, 200ER, 200ERM, 300, 300ER, 300ERF
B764	B764	B767	400ER
B772	B772	B777	200, 200ER, 300, 300ER
B773	B773	B777	300, 300ER
BE40	BE40	BEECHJET 400A	ALL SERIES
BE20	BE20	BEECH 200 -KINGAIR	ALL SERIES
C500	C500	500 CITATION, 500 CITATION I, 501 CITATION I SINGLE PILOT	ALL SERIES
C525	C525	525 CITATIONJET, 525 CITATIONJET I	ALL SERIES
C525-II	C25A	525A CITATIONJET II	ALL SERIES
C525 CJ3	C25B	CITATIONJET III	ALL SERIES
C550-552	C550	552 CITATION II	ALL SERIES
C550-B	C550	550 CITATION BRAVO	ALL SERIES
C550-II	C550	550 CITATION II, 551 CITATION II SINGLE PILOT	ALL SERIES
C550-SII	C550	S550 CITATION SUPER II	ALL SERIES
C560	C560	560 CITATION V, 560 CITATION V ULTRA, 560 CITATION V ULTRA ENCORE	ALL SERIES
C56X	C56X	560 CITATION EXCEL	ALL SERIES
C650	C650	650 CITATION III , 650 CITATION VI , 650 CITATION VII	ALL SERIES
C750	C750	750 CITATION X	ALL SERIES
CARJ	CRJ1, CRJ2	REGIONALJET	100, 200, 200ER, 200LR
CRJ-700	CRJ7	REGIONALJET	700
CRJ-900	CRJ9	REGIONALJET	900
CL600	CL60	CL-600 CL-601	CL-600-1A11 CL-600-2A12, CL-600-2B16
CL604	CL60	CL-604	CL-600-2B16
BD100	CL30	CHALLENGER 300	ALL SERIES
BD700	GL5T	GLOBAL 5000	ALL SERIES
CONC	CONC	CONCORDE	ALL SERIES
DC10	DC10	DC-10	10, 10F, 15, 30, 30F, 40, 40F
DC86-7	DC86, DC87	DC-8	62, 62F, 72, 72F

Monitoring Group	ICAO Desig-nator	A/C Type	A/C Series
DC93	DC93	DC-9	30, 30F
DC95	DC95	DC-9	SERIES 51
E135-145	E135, E145	EMB-135, EMB-145	ALL SERIES
F100	F100	FOKKER 100	ALL SERIES
F2TH	F2TH	FALCON 2000	ALL SERIES
F70	F70	FOKKER 70	ALL SERIES
F900	F900	FALCON 900, FALCON 900EX	ALL SERIES
FA10	FA10	FALCON 10	ALL SERIES
FA20	FA20	FALCON 20 FALCON 200	ALL SERIES
FA50	FA50	FALCON 50, FALCON 50EX	ALL SERIES
GALX	GALX	1126 GALAXY	ALL SERIES
GLEX	GLEX	BD-700 GLOBAL EXPRESS	ALL SERIES
GLF2	GLF2	GULFSTREAM II (G-1159),	ALL SERIES
GLF2B	GLF2	GULFSTREAM IIB (G-1159B)	ALL SERIES
GLF3	GLF3	GULFSTREAM III (G-1159A)	ALL SERIES
GLF4	GLF4	GULFSTREAM IV (G-1159C)	ALL SERIES
GLF5	GLF5	GULFSTREAM V (G-1159D)	ALL SERIES
H25B-700	H25B	BAE 125 / HS125	700B
H25B-800	H25B	BAE 125 / HAWKER 800XP, BAE 125 / HAWKER 800, BAE 125 / HS125	ALL SERIES/A, B/800
H25C	H25C	BAE 125 / HAWKER 1000	A , B
IL86	IL86	IL-86	NO SERIES
IL96	IL96	IL-96	M , T, 300
J328	J328	328JET	ALL SERIES
L101	L101	L-1011 TRISTAR	1 (385-1), 40 (385-1), 50 (385-1), 100, 150 (385-1-14), 200, 250 (385-1-15), 500 (385-3)
L29B-2	L29B	L-1329 JETSTAR 2	ALL SERIES
L29B-731	L29B	L-1329 JETSTAR 731	ALL SERIES
LJ31	LJ31	LEARJET 31	NO SERIES, A
LJ35/6	LJ35 LJ36	LEARJET 35 LEARJET 36	NO SERIES, A
LJ40	LJ40	LEARJET 40	ALL SERIES
LJ45	LJ45	LEARJET 45	ALL SERIES
LJ55	LJ55	LEARJET 55	NO SERIES B, C
LJ60	LJ60	LEARJET 60	ALL SERIES
MD10	MD10	MD-10	ALL SERIES
MD11	MD11	MD-11	COMBI, ER, FREIGHTER, PASSENGER
MD80	MD81, MD82,	MD-80	81, 82, 83, 87, 88

Monitoring Group	ICAO Desig-nator	A/C Type	A/C Series
	MD83, MD87, MD88		
MD90	MD90	MD-90	30, 30ER
P180	P180	P-180 AVANTI	ALL SERIES
PRM1	PRM1	PREMIER 1	ALL SERIES
T134	T134	TU-134	A, B
T154	T154	TU-154	A , B, M, S
T204	T204, T224, T234	TU-204, TU-224, TU-234	100, 100C, 120RR, 200, C
YK42	YK42	YAK-42	ALL SERIES

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

1 Background

1.1 The Asia Pacific Airspace Safety Monitoring (APASM) Task Force established by the Asia Pacific Air Navigation Planning Implementation Regional Group (APANPIRG) noted that requirements for monitoring aircraft height-keeping performance and the safety of reduced vertical separation minimum (RVSM) operations had been more comprehensively developed than for other Air Traffic Management (ATM) services, such as reduced horizontal separation based on required navigation performance (RNP), and monitoring of Air Traffic Services (ATS) datalink systems. For RVSM, a handbook with detailed guidance on the requirements for establishing and operating Regional Monitoring Agencies (RMA) was at an advanced stage of development by the ICAO Separation and Airspace Safety Panel (SASP). (The RMA Handbook has since been completed and is expected to be adopted by ICAO in 2005). There was no comparable document under development by ICAO for ATS datalink applications and so the APASM Task Force developed draft guidance material for the Asia/Pacific Region covering safety and performance monitoring for ATS datalink applications.

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

1.3 The APASM Task Force was succeeded by the Regional Airspace Safety Monitoring Advisory Group (RASMAG) of APANPIRG, which decided to adopt this APASM material and further develop it to become the standard guidance material for end-to-end safety and performance monitoring of ATS datalink systems in the Asia Pacific region.

1.4 Within the remainder of the Asia Pacific Region, the Bay of Bengal and South East Asia Coordinating Groups are mirroring what has been done by IPACG and ISPACG and have created implementation teams and CRAs to accomplish this activity. These implementation teams also perform the interoperability activities which will continue after the implementation is complete. This guidance material focuses on interoperability issues, both prior to and following implementation.

2 Requirements for Safety and Performance Monitoring

2.1 Annex 11, at 2.26.5, states:

> "Any significant safety-related change to the ATC system, including the implementation of a reduced separation minimum or a new procedure, shall only be effected after a safety assessment has demonstrated that an acceptable level of safety will be met and users have been consulted. When appropriate, the responsible authority shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met."

2.2 ATS datalink applications, such as ADS, CPDLC and ATS interfacility data communication (AIDC), are increasingly being used in support of separation and particularly of reduced separation minima. Accordingly, it is necessary to provide the monitoring required by Annex 11 to those

datalink services. Datalink services comprise both a technical and an operational element. These guidelines, which apply only to the technical element, propose a structure and methodology for monitoring the technical end-to-end safety performance of air-ground and ground-air datalink services. The operational aspects of datalink monitoring are carried out by the appropriate Safety Monitoring Agency (SMA).

2.3 Ground-ground datalink systems supporting applications such as AIDC are essentially simpler and more direct than air-ground systems, and monitoring can be achieved directly between the concerned ATS providers. However, it should be noted that States have a responsibility to ensure that monitoring of ground-ground datalink systems is carried out in support of the implementation of reduced separation minima. Monitoring of ground-ground datalink performance is outlined in Appendix A.

2.4 The requirement for on-going monitoring after implementation is based on several factors, including both degradation of performance with time and changes to equipment which may occur, either through modification or under renewal programmes. The use of ADS-B to support separation and the introduction of the Aeronautical Telecommunication Network (ATN) will be significant changes to the system that will require monitoring programmes.

3 Purpose of Guidance Material

3.1 The purpose of this guidance material is to:

a) Provide a set of working principles common to all States implementing ATS datalink systems.

b) Provide detailed guidance on the requirements for establishing and operating an interoperability team.

c) Provide detailed guidance on the requirements for establishing and operating a Central Reporting Agency.

d) Promote a standardized approach for implementation and monitoring within the Region.

e) Promote interchange of information among different Regions to support common operational monitoring procedures.

4 Establishment and Operation of an Interoperability Team and CRA

4.1 Recognizing the safety oversight responsibilities necessary to support the implementation and continued safe use of ATS datalink systems, the following standards apply to any organization intending to fill the role of an interoperability team:

a) The organization must receive authority to act as an interoperability team as the result of a decision by a State, a group of States or a regional planning group, or by regional agreement.

b) States should appoint a CRA that has the required tools and personnel with the technical skills and experience to carry out the CRA functions.

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

5 Interoperability Teams

5.1 The technologies adopted to provide ATS datalink functionality exist in several different domains (e.g. aircraft, satellite, ground network, air traffic service units and human factors) and these elements must be successfully integrated across all domains. Airborne and ground equipment from many different vendors, as well as the sub-systems of several different communication networks, must inter-operate successfully to provide the required end-to-end system performance. In addition, standardised procedures must be coordinated among many different airlines and States to provide the desired operational performance. Technical and operational elements must then coalesce to allow the various applications to demonstrate mature and stable performance. Only then can essential benefits be realized.

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

5.3 Although the monitoring process described above was developed for FANS-1/A based CPDLC and ADS applications, it applies equally to ATN-based ATS applications. This was validated during the Preliminary EUROCONTROL Test of Air/ground data Link (PETAL) implementation of ATN-based ATS datalink services in Maastricht Area Control Centre.

5.4 Role of the Interoperability Team

5.4.1 The role of the interoperability team is to address technical and operational problems affecting the transit of datalink aircraft through international airspace. To do this, the interoperability team must oversee the end-to-end monitoring process to ensure the datalink system meets, and continues to meet, its performance, safety, and interoperability requirements and that operations and procedures are working as specified.

5.4.2 The specific tasks of an interoperability team are:

a) Initiate and oversee problem reporting and problem resolution processes.

b) Initiate and oversee end-to-end system performance monitoring processes.

c) Oversee the implementation of new procedures.

d) Report to the appropriate State regulatory authorities and to the appropriate ATS coordinating group.

5.4.3 Terms of reference for an interoperability team are shown at Appendix B.

5.5 Interoperability Team Members

5.5.1 The principal members of an interoperability team are the major stakeholders of the sub-systems that must interoperate to achieve the desired system performance and end-to-end operation. In the case of ATS datalink systems, the major stakeholders are aircraft operators, ATS providers, and communication service providers.. Other stakeholders such as international organizations, and airframe and avionics manufacturers also play an important role and should be invited by the major stakeholders to contribute their expertise.

6 Central Reporting Agencies

6.1 Work must be done on a daily basis for an interoperability team to achieve its important goals of problem resolution, system performance assurance, and planning and testing of operations that will enable benefits. A dedicated sub-team, the CRA, is required to do the daily monitoring, coordination, testing and problem research tasks for the interoperability team. Appendix C shows a table of CRA tasks and the associated resource requirements.

6.2 A CRA should be established in order to determine the safety performance of the datalink systems before the implementation of reduced separation minima in a particular area, and it should remain active throughout the early stages of implementation. However, as the performance of the systems stabilises to a satisfactory level, it should be possible to reduce the number of CRAs in the region by combining responsibility for different areas.

6.3 The functions of a CRA are:

a) To develop and administer problem report processes.

b) To maintain a database of problem reports.

c) To process monthly end-to-end system performance reports from air traffic service providers.

d) To coordinate and test the implementation of new procedures resulting from ATS datalink systems for a given region.

e) To administer and monitor an informal end-to-end configuration process.

f) To manage data confidentiality agreements as required.

g) To identify trends.

h) To provide regular reports to the interoperability team.

6.4 CRA Resource Requirements

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

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

6.4.3 Coordination is an important part of the CRA's job. In the pursuit of problem resolution, action item resolution, monitoring and testing, many issues arise that require coordination among the various stakeholders. The CRA has a primary responsibility to provide this coordination function as delegated by the interoperability team. Coordination between CRAs is also important, particularly to expand the information database on problems and trends; there may be a need for CRA coordination within the region and with CRAs in other regions. An incident may appear to be an isolated case, but the collation of similar reports by a CRA or the CRA coordinating group might indicate an area that needs more detailed examination

7 Working Principles for Central Reporting Agencies

7.1 The working principles in this guidance material result from the combined experience of the North Atlantic FANS Implementation Group, ISPACG FANS Interoperability Team, IPACG FANS Interoperability Team, and the ATN implementation in Maastricht ACC.

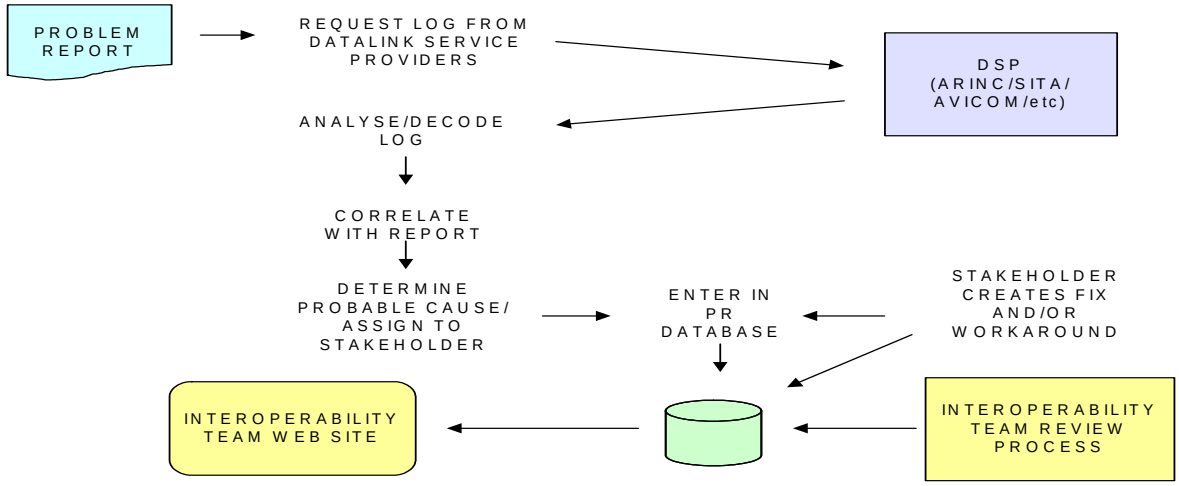
7.2 Confidentiality Agreements

7.2.1 Confidentiality of information is an established principle for problem reporting, and so reports must be de-identified before being made accessible to other agencies. However, it is necessary for the CRA to retain the identity of the original reports so that problem resolution and follow-up action can be taken.

7.2.2 The CRA must initiate and maintain confidentiality agreements with each entity providing problem reports.

7.3 Problem Identification and Resolution

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



(Editors Note: change wording of FIT web site and FIT review process above)

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

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

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

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

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

7.3.6 Once the data has been collected, the analysis can begin. For this, it is necessary to be able to decode all the messages involved, and a tool that can decode every ATS datalink message type used in the region is essential. These messages include:

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

7.3.7 The analysis of the decoded messages requires a thorough understanding of the complete message traffic, including:

- Media management messages.
- Relationship of ground-ground and air-ground traffic.
- Message envelope schemes used by the particular datalink technology (ACARS, ATN, etc).

7.3.8 The analyst must also have a good understanding of how the aircraft systems operate and interact to provide the ATS datalink functions, as many of the reported problems are airplane system problems.

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

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

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

7.4 Mitigating Procedures

7.4.1 The CRA's responsibility does not end with determining the cause of the problem and identifying a fix. As part of that activity, and because a considerable period may elapse while software updates are applied to all aircraft in a fleet, procedural methods to mitigate the problem may have to be developed while the solution is being coordinated. The CRA should identify the need for such procedures and develop recommendations for implementation by the service providers and operators involved.

7.5 Routine Datalink Performance Reporting

7.5.1 An important part of datalink safety performance is the measurement of the end-to-end performance. This should, of course, be carried out prior to implementation of new separation minima, but should continue on a regular basis to give assurance that the safety requirements continue to be met. Datalink performance assessment is based on round-trip time,

availability, integrity, reliability and continuity, and ATS providers should provide the CRA with regular measurements of these parameters.

7.5.2 The CRA will use the information supplied by ATS providers to produce a performance assessment against the established datalink requirements for the region. These requirements are set according to the separation minima being applied, and so may differ within different areas according to usage.

7.5.3 The CRA performance assessment should be made available to the RMA and SMA for their calculation of system performance against the minimum values defined in the FANS 1/A Operations Manual. The system performance criteria are at Appendix D.

7.5.4 ADS round-trip times are normally measured as the time between sending a contract request and receiving the associated Acknowledgement (ACK) or Message Assurance (MAS) message. CPDLC round-trip times are normally determined from the ATSU end-system time stamps for transmission of the uplink message and reception of the associated MAS.

7.5.5 ADS and CPDLC downlink one-way times are defined by the difference between the aircraft time stamp and the ASTU end-system reception time stamp.

7.5.6 ADS and CPDLC success rates are only available for uplink messages. The success rate is expressed as the percentage of messages that receive a successful ACK or MAS within a specified time.

7.5.7 AIDC round trip times may be obtained from the difference between message transmission and reception of the Logical Acknowledgement Message (LAM). The success rate is expressed as the percentage of messages that are successfully delivered to the destination ATSU.

7.6 Configuration Monitoring

7.6.1 A variety of technical systems are involved in the datalink process and changes, particularly to software and software parameters, are not infrequent; any change may have an impact on the overall performance of the datalink. It is therefore important that the CRA is kept informed of each change of configuration of each system. With this information it is often possible to identify changes that lead to improvements or deteriorations in the datalink performance or that may be associated with particular problems.

7.6.2 All ATS providers, communication service providers, aircraft operators and avionics suppliers should therefore report all system configuration changes to the CRA. The CRA will then maintain a database of configuration changes for each system or sub-system. It is not necessary for the CRA to know the details of changes, but where a change is expected to affect performance, information on the likely effect should be provided.

7.7 New Procedures and Improved Performance Requirements

7.7.1 The CRA may recommend new end-to-end datalink system performance requirements, either to accommodate new operational procedures or to take account of recognised problems.

7.7.2 The CRA may recommend the testing and implementation of new procedures.

APPENDIX A

METHODOLOGY FOR MONITORING AIDC

1 Introduction

1.1 AIDC plays an important role in ATC coordination, and may become a significant element of ATC in the support of reduced separation minima. The performance of AIDC operations should therefore be monitored as part of the required monitoring process prior to the implementation of reduced separation minima.

1.2 AIDC operates essentially over fixed networks and generally has only two or three involved parties: the ATS providers and network providers. It is therefore generally unnecessary to develop a FIT-type approach to safety monitoring; instead such monitoring and problem identification and resolution can be carried out directly by the concerned parties.

1.3 Because, in general, fixed networks are used for AIDC, continuous performance monitoring after implementation of reduced separation minima is not generally necessary, though annual performance and availability checks are recommended. Monitoring should also take place after any changes to the network or the end-user equipment. This will be particularly important during the implementation of the ATN.

2 AIDC Technical Performance

2.1 Two major criteria for monitoring AIDC technical performance are the achievement of acceptable delivery times and the reliability of message delivery. Delivery times can best be measured in terms of the end-to-end round trip time. Reliability is measured as the AIDC message delivery success rate.

3 End-to-end Round-Trip Time

3.1 The end-to-end round trip message time may be measured as the time difference between the transmission of an AIDC message and the reception of the corresponding Logical Acknowledgement Message (LAM) or Logical Rejection Message (LRM). If the originating AIDC system receives neither a LAM nor an LRM from the receiving system within a specified time limit (a variable system parameter, typically 5 minutes), it will declare a time-out, and the time parameter must be used as the round-trip time.

3.2 Any AIDC message requiring a LAM response may be used; CPL messages are perhaps the most used and therefore the most convenient.

3.3 A large number of measurements of round-trip times should be averaged for performance reporting.

4 Message Delivery Success Rate

4.1 The Message Delivery Success Rate may be expressed as the percentage of messages successfully delivered to the destination ATSU.

4.2 Unsuccessful delivery is indicated by either the reception of an LRM or a time-out due to non-reception of a LAM within a specified time.

4.3 Case-1: LRM Received

4.3.1 When an AIDC system detects an error in a received message, it responds with a Logical Reject Message (LRM) to the originating system. Receipt of the LRM indicates that the original message was not successfully delivered.

4.4 Case-2: Time out

4.4.1 The time-out indicates non-delivery of the message (and initiates various actions within the AIDC system).

$$\text{Message Delivery Success Rate} = 1 - \frac{(LRM + TO)}{TOT}$$

Where:
LRM = number of received LRMs
TO = number of Time Outs
TOT = total number of messages

4.5 A large number of measurements of delivery success rates should be averaged for performance reporting.

5 Reporting

5.1 ATS providers should report the results of AIDC performance monitoring to RASMAG.

APPENDIX B

TERMS OF REFERENCE FOR AN INTEROPERABILITY TEAM

Reporting and problem resolution processes

- To establish a problem reporting system.
- To review de-identified problem reports and determine appropriate resolution.
- To identify trends.
- To develop interim operational procedures to mitigate the effects of problems until such time as they are resolved.
- To monitor the progress of problem resolution.
- To prepare summaries of problems encountered and their operational implications.

System performance and monitoring processes

- To determine and validate system performance requirements.
- To establish a performance monitoring system.
- To assess system performance based on information from the CRA.
- To authorise and coordinate system testing.
- To identify accountability for each element of the end-to-end system.
- To develop, document and implement a quality assurance plan that will provide a path to a more stable system.
- To identify configurations of the end-to-end system that provide acceptable datalink performance, and to ensure that such configurations are maintained by all stakeholders.

New procedures

- To coordinate testing in support of implementation of enhanced operational procedures

Reporting

- To report safety-related issues to the appropriate State or regulatory authorities for action
- To provide reports to each meeting of the implementation team or ATS coordinating group, as appropriate.
- To provide reports to RASMAG.

APPENDIX C

CRA TASKS AND RESOURCE REQUIREMENTS

NOTE: CHANGE ORDER TO MATCH PARA 6.3

CRA Task	Resource Requirement
Manage data confidentiality agreements as required	Legal services Technical expertise
Develop and administer problem report process: • de-identify all reports • enter de-identified reports into a database • keep the identified reports for processing • request audit data from communication service providers • assign responsibility for problem resolution where possible • analyse the data Identify trends	Problem reporting data base ATS audit decode capability Airborne test bench as a minimum, simulator highly recommended ATS simulation capability (CPDLC and ADS)
Coordinate and test the implementation of new procedures	Airborne test bench as a minimum, simulator capability highly recommended ATS simulation capability (CPDLC and ADS) ATS audit decode and report capability Technical expertise Operational expertise
Administer and monitor an informal end-to-end configuration process.	Technical expertise
Report to the interoperability team	Technical expertise

APPENDIX D

FANS 1/A OPERATION MANUAL
SYSTEM PERFORMANCE CRITERIA

The table below defines the minimum values to be met and verified. This does not prevent ATS service providers from negotiating more constraining contractual requirements with their communication service providers if it is thought necessary.

Criteria	Definition	Values
Performance	End to end round trip time for uplinks. (sending and reception of MAS)	Round trip time of 2 minutes, 95% of messages. Round trip time of 6 minutes, 99% of messages.
	End to end one way time for downlinks. (comparison of message time stamp and receipt time)	One way time of 1 minute, 95% of messages. One way time of 3 minutes, 99% of messages
	Uplink messages only: Undelivered messages will be determined by: • Message assurance failure is received. After trying both VHF and SATCOM. Depending on reason code received, the message might, in fact, have reached the aircraft. • No message assurance or flight crew response is received by ATSU after 900 seconds	Less than 1% of all attempted messages undelivered
Availability	The ability of the network data link service to perform a required function under given conditions at a given time: The maximum allowed time of continuous unavailability or downtime should be declared MTTR (Mean Time To Repair) *	99.9% TBD
Reliability	The ability of a data link application/system to perform a required function under given conditions for a given time interval: it can be expressed in MTBF (Mean Time Between failure) *	TBD
Integrity	The probability of an undetected failure, event or occurrence within a given time interval.	10^{-6}/hour

* Availability = MTBF x 100/(MTBF+MTTR)

Note: RTCA SC189/EUROCAE WG 53 defines the performance requirements for specific operational environments.

— END —

DRAFT AIP AMENDMENT

IMPLEMENTATION OF STRATEGIC 2 NM LATERAL OFFSET PROCEDURES

X. STRATEGIC LATERAL OFFSETS IN OCEANIC OR REMOTE CONTINENTAL AIRSPACE

X.1 Offsets are only applied in the oceanic (or remote continental) airspace in the XXX FIR.

X.2 Offsets are applied only by aircraft with automatic offset tracking capability.

X.3 The following requirements apply to the use of the offset:

a. The decision to apply a strategic lateral offset is the responsibility of the flight crew.

b. The offset shall be established at a distance of one or two nautical miles to the right of the centre line relative to the direction of flight.

c. The strategic lateral offset procedure has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, one of the three available options (centreline, 1NM or 2NM right offset) shall be used.

d. In airspace where the use of lateral offsets has been authorized, pilots are not required to inform air traffic control (ATC) that an offset is being applied.

e. Aircraft transiting areas of radar coverage in airspace where offset tracking is permitted may initiate or continue an offset.

LANGUAGE PROFICIENCY

ICAO RATING SCALE FOR OPERATIONAL LEVEL 4

Pronunciation: (Assumes a dialect and/or accent intelligible to the aeronautical community)

Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but only sometimes interfere with ease of understanding.

Structure: (Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task)

Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.

Vocabulary:

Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work-related topics. Can often paraphrase successfully when lacking vocabulary in unusual or unexpected circumstances.

Fluency:

Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers or connectors. Fillers are not distracting.

Comprehension:

Comprehension is mostly accurate on common, concrete, and work related-topics when the accent or variety used is sufficiently intelligible for an international community of users. When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.

Interactions:

Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming, or clarifying.

(Note: For complete information on the ICAO language proficiency rating scales, please refer to the Attachment to Annex 1.)
